THE BULLETIN OF THE

JULY–AUGUST 1

AMERICAN SOCIETY OF HOSPITAL PHARMACISTS

VOLUME 4

NUMBER

Apothecary's Prayer

O God, great Master
Of the healing arts,
Bless my slow unwieldy hands;
Make skilled and sensitive
My fingertips for all demands;
As counter for disaster,
Fill my mental starts
With keenness; let me live.

That other lives may through
Deft medium of my science,
Persuance find in health.
Let each capsule that I count
Yield strength rewarding wealth;
Each liquid that I mix anew,
Each ointment for appliance,
In all and each amount.

Be healing prayer.
Let me ne'er forget
Thy generous Providence
Held within my trembling hands.
Help me justly execute, dispense
And be cautious of my ware—
And while Life's hour-glass yet
Runs, with the doctor guide its sands.

Place within my heart
Alert and wholesome fear,
Lest I misweigh a single grain,
And Death comes stalking from my shelves.
Make impotent limbs to walk; pain
And sorrow's counterpart
With my potions disappear;
And God, give Hope unto themselves.

—Sister Mary Junilla, O.S.F.; Ph.G., Chief Pharmacist, Queen of Angels Hospital, Los Angeles, California.

THE BULLETIN
OF THE

VOLUME 4 JULY-AUGUST 1947 NUMBER 4

THE BULLETIN is published bimonthly by the American Society of Hospital Pharmacists, a national organization devoted to the profession of hospital pharmacy, dedicated to the interests of the hospital pharmacist, and pledged to co-operate with the American Pharmaceutical Association with which it is affiliated.

Contributions of articles by hospital pharmacists, or by others interested in the progress of this important branch of the public health profession, will be accepted if they are of general interest to the hospital pharmacist. The editors reserve the right to revise all material submitted, if necessary.

Manuscripts submitted for publication should be typewritten in double spacing on one side of paper 8 1/2 x 11". Whenever possible a photograph, drawing, or printed form to illustrate the topic that is discussed in the article should be included.

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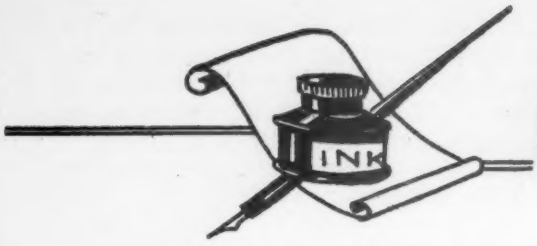


CORRESPONDENCE

Dear Sirs: Enclosed please find my 1947 dues for continued membership in the American Society of Hospital Pharmacists.

I enjoy THE BULLETIN very much and find it more complete and interesting with each new issue. It shows the sincere effort and work of the editorial staff.

Robert L. Shumaker

Akron, Ohio

Dear Sirs: Enclosed is my application for membership in the American Society of Hospital Pharmacists. I am a life member of the American Pharmaceutical Association and have become eligible to join the A.S.H.P. having completed a year of professional service in the Veterans Administration Hospital, Togus, Maine.

We do not have a Maine Society of Hospital Pharmacists. I am most interested in forming one as soon as possible and have conferred with several of my colleagues. We are in accord and believe it should be fashioned after the by-laws of the American Society of Hospital Pharmacists. Any help forthcoming will be greatly appreciated.

The editorial in THE BULLETIN, Volume 3, Number 5, adequately states the "Professional Privileges and Responsibilities" presented to the professional pharmacist. If there is any contribution that I can make for the advancement or betterment of Pharmacy, I am at your service.

Theodore R. Tibbetts

Augusta, Maine

Dear Sirs: I have just received your letter soliciting my membership in the American Society of Hospital Pharmacists and I would be pleased to receive copies of THE BULLETIN of the A.S.H.P. and the Journal of the American Pharmaceutical Association, Practical and Scientific Editions.

Thanking you for your letter and invitation to join your society.

J. A. MacDonald

Toronto General Hospital
Toronto, Canada

Dear Sirs: It is requested that complete information relative to joining the American Society of Hospital Pharmacists and value to members of the pharmacy profession be submitted. In the 12 hospitals and three regional offices in this branch there are 31 registered pharmacists employed. Upon receipt of the above information, it will be distributed to each V.A. Hospital in this branch area for individual action.

J. M. W. Kwasnicki

Chicago, Illinois

Dear Sirs: I am enclosing application for Associate Membership in the American Society of Hospital Pharmacists in order to subscribe to your Bulletin.

Robert Fialk

Newark, New Jersey

Dear Sirs: I want to thank you for THE BULLETIN'S you have mailed me. I have found them interesting and instructive. Since I have been interested in your Society for some time, applications for membership in both the American Pharmaceutical Association and the American Society of Hospital Pharmacists are enclosed. I am a registered pharmacist in Delaware and have had four years experience in hospital pharmacy.

C. Kershaw

Wilmington, Delaware

Dear Sirs: I have just received the March-April issue of THE BULLETIN and find it very interesting and instructive. I want to congratulate you on this fine publication.

The medical staff frequently refer to your publication in our pharmacy files and find it very useful.

I was very happy to meet you at the Institute held in Chicago last month.

C. L. Busick

Stockton, California

PHARMACISTS PROMOTION IN VETERANS ADMINISTRATION

EDITORIAL

Under present regulations, in the Veterans Administration it is not possible for a pharmacist who does not have a Bachelor of Science degree to receive a promotion to a higher grade than he now holds.

It is our understanding that the reason for this situation is the reluctance of Civil Service to accept two sets of standards for pharmacists. Thus under present conditions the requirements for promotion specify a Bachelor of Science degree. Civil service does not believe it a wise policy to establish another standard under which those individuals with a two or three year degree may obtain promotion.

Obviously since there are many pharmacists who entered the Veterans Administration before the four year course was available or required, this ruling is undoubtedly unfair to them as a group. It must be remembered, however, that many of those with a two or three year degree have had the opportunity during the past several years, and at the present time to either obtain a leave of absence or by part-time college work to fulfill the requirements for a Bachelor of Science degree. On the other hand it must be recognized that probably a greater number, because of family responsibilities or because of the unavailability of a College of Pharmacy in their city of assignment, have been unable to attempt further college work.

It must also be recognized and frankly admitted that there are many outstanding pharmacists in the Veterans Administration who do not have a Bachelor of Science degree. This is, of course, equally true of pharmacists in non-government hospitals as well as those in retail pharmacy. These pharmacists who are outstanding have attained their present status by a constant alertness to new ideas and knowledge throughout the years. They have kept themselves informed of the current advances of their profession by constant study, attendance at scientific meetings, discussions with their professional colleagues, visits to other hospitals and by individual participation in professional activities.

They have maintained an attitude of awareness that their profession is growing and that they as professional individuals owe as their duty to their profession that it should not be kept from advancing, that it should not lose stature, that its place in the public health should not be improperly reflected by their lack of interest and effort as individuals.

It is to this group of pharmacists in the Veterans Administration that the greatest injustice is done by the present regulations. But we would guess that their number is small. For it is probably true in the Veterans Administration hospitals as in other similar institutions that too many possess the wrong kind of inertia. It is well recognized that one of the major causes of poor pharmacy service in hospitals, and a generally lower level of pay, is the fact that so many who entered hospital pharmacy were content with a job; they lacked initiative, were not receptive to changes, had no interest in new ideas, felt no need to keep abreast of current knowledge, and were content to play a minor role because it was the easiest thing to do.

Fortunately these conditions are now being corrected in Veterans Hospitals as well as in non-governmental institutions. This is being done by a more careful selection of applicants, by outlining greater responsibilities for the pharmacist, by encouraging the individual in many ways to recognize his duty to himself and his profession, and by better standards of remuneration.

We believe that the vision of Director Paul Briggs and his staff in expanding the role of the pharmacist in V. A. Hospitals, in establishing a definite inter-relationship between the pharmacist and the other professional staffs of the hospital, in obtaining acceptance by Civil Service of the basic educational requirement of a Bachelor of Science degree, in raising the pay of the pharmacist and providing greater opportunities for advancement is without doubt one of the greatest contributions ever made toward the advancement of the practice of pharmacy in hospitals. The influence of these advances have only begun to be felt. They will have their effect on the programs for pharmacy in the Army and Navy and will surely establish a new concept of the responsibility of the pharmacist for non-governmental hospitals.

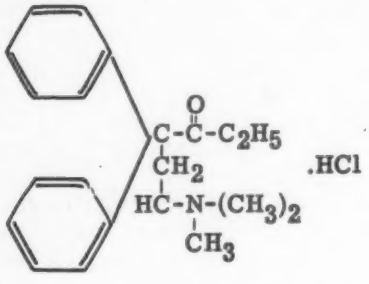
Nothing should be done to lower the educational requirements or to lessen the responsibility for pharmacists entering Veterans Administration. However, in all fairness, there should be some means found to provide for the promotion of deserving pharmacists possessing less than a Bachelor of Science degree. But the basis of promotion should not be based principally on years of service but rather upon the record of the individual as it reflects his initiative, his ability, his responsibility, and his knowledge as a professional person.

METHADON

LATEST INFORMATION ON A NEW ANALGESIC DRUG PRESENTED FOR THE INFORMATION OF THE HOSPITAL PHARMACIST.

Methadon is a synthetic analgesic drug which has been recently released for use under Federal Narcotic Regulations. The development of methadon resulted from the work of German chemists who were attempting to prepare antispasmodic drugs. Following the victory of the Allies in World War II, The Department of Commerce made the knowledge concerning this compound available in its report number PB 981. The drug, known under its original number as 10820 is now marketed under the name of Dolophine by Eli Lilly and Company who formerly called it Amidone. Abbott Laboratories market the drug under its official name Methadon. The Winthrop Chemical Company uses the name Adanon. The drug has been officially named Methadon.

Chemically, methadon is 6-dimethylamino-4, 4-diphenyl 3 heptanone hydrochloride. As may be observed from the structural formula the drug is not related to either morphine or merperidine. It is a bitter, white crystalline compound, soluble in water and alcohol but insoluble in ether. Its melting point is between 236° and 236.5°C.



PHARMACOLOGY

In general the pharmacological actions of methadon closely resemble those of morphine, although they do differ in several important respects. Its analgesic potency in therapeutic doses probably lies between that of merperidine and morphine. However, it must be remembered that the analgesic effect of various drugs is difficult to compare and that each of them has its individual advantages and limitations in pain from various causes. The duration of action of the drug is usually from 3 to 4 hours although many patients may be relieved for as long as 6 hours by a single dose. It produces less sedation, hypnosis, and euphoria than does morphine.

Like morphine, methadon depresses respiration. Single doses have little effect on respiration but since the action of the drug tends to be cumulative the customary precautions should be observed when the drug is given at regular three or four hour intervals. Methadon, like morphine, produces constipation after prolonged administration since it increases the tone and amplitude of intestinal contractions thus interfering with the normal propulsive movements of the bowel by producing a sustained increase in tonicity. It also depresses the formation of urine. It alleviates spasm of the urinary bladder.

Nausea and vomiting are produced by methadon through its action on the vomiting center of the medulla. This may occur after oral or parenteral administration. The drug has an antitussive action.

Methadon acts as a miotic but the reduction in the size of the pupils is not as great as that produced by therapeutic doses of morphine. Furthermore, this effect seems to disappear after the regular administration of the drug for a week or more.

ADDICTION

Studies by the U. S. Public Health Service reveal that methadon will give the morphine addict as much satisfaction as will any opium derivative. Increasing amounts of the drug administered subcutaneously four times a day to former morphine addicts results in addiction. In the treatment of chronic morphinism it has been found that methadon may be substituted for morphine. After four or five days of treatment the administration of methadon may be suddenly discontinued without producing the physical signs of dependence that follow the abrupt withdrawal of morphine. Since methadon is addicting, its distribution is regulated by the Federal Narcotic Bureau.

SIDE EFFECTS AND TOXICITY

Side effects include, in the order of their frequency, nausea, vomiting, lightheadedness, drowsiness, dryness of the mouth, perspiration, and mental depression. Miosis occurs after repeated administration of the drug but tends to disappear within a week. The side effects are usually mild and may be observed after oral or parenteral use of the drug. Nausea and vomiting occur most often when doses of more than 7.5 mg of the drug are given by mouth. For some unexplained reason large doses may be given by injection with a lower incidence of nausea or vomiting. Dizziness and nausea are more apt to occur in ambulatory patients rather than in those who are hospitalized. The incidence of side effects tends to increase as the interval between doses is shortened. The drug should not be used in conditions in which the respiratory center is depressed, or in profound vascular collapse.

ACTIONS AND USES

Methadon is used to control postoperative, renal colic, osseous and other types of pain including that associated with carcinoma.

The drug is not a good preanesthetic agent since it does not produce sufficient euphoria or sedation to alleviate preoperative apprehension. However, a combination of methadon with a barbiturate or scopolamine may be used for this purpose.

For the relief of labor pain methadon is inferior to merperidine and other drugs used for this purpose. When used in larger doses than 15 mg given three times within the twelve hours preceding birth it was found to markedly depress the infant's respiration.

Methadon is an effective antitussive agent. A dose of 2.5 mg given every four hours has been found to control the chest pain and cough associated with chronic pulmonary tuberculosis.

DOSAGE AND ADMINISTRATION

The drug may be given orally, or by subcutaneous or intravenous injection. It is used intravenously only to control intractable pain. The dosage range is 2.5 to 10 mg given every 4 to 6 hours. For moderate pain 2.5 mg is given by mouth every 4 hours. For severe pain 5 mg is given orally or by subcutaneous injection every 4 hours. For the more severe pain of renal colic or postoperative pain 10 mg is given subcutaneously every 4 to 6 hours.

The pain of carcinoma is usually controlled by 5 of 7.5 mg of the drug, although as much as 10 mg may be required.

The dosage for infants or children may be calculated on the basis of body weight or age according to the accepted rules.

Cough may be controlled by the administration of from 1.5 to 2.5 mg of methadon given every 4 to 6 hours. It has been found to control the chest pain and cough associated with chronic pulmonary tuberculosis when given in oral doses of 2.5 every 4 hours.

PREPARATIONS

Methadon is available in tablets containing 2.5 mg; 5 mg; or 7.5 mg of the drug. A solution for injection may be obtained in a 20 cc multiple dose vial containing 10 mg of methadon per cc. A 1 cc ampule containing 10 mg of the drug is supplied by Eli Lilly and Company. The latter firm also supplies a syrup containing 1.7 mg of the drug per 5 cc. Abbott Laboratories, The Winthrop Chemical Company and The Eli Lilly and Company supply methadon tablets and the solution for injection. The drug must be ordered on a narcotic order form.

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A REVIEW OF THE LITERATURE ON THE PHARMACEUTICAL APPLICATIONS OF ISOPROPYL ALCOHOL PREPARED FOR THE USE OF THE HOSPITAL PHARMACIST

ISOPROPYL ALCOHOL

BY ALBERT L. PICCHIONI
PHARMACIST SUPERVISOR
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ANN ARBOR, MICHIGAN

Isopropyl alcohol, (dimethyl carbinol, secondary propyl alcohol, isopropanol, propanol-2 "petrohol", CH_3-CH(OH)-CH_3) is the first member of the chemical series known as secondary alcohols.

Isopropyl alcohol is similar to the more familiar ethyl alcohol in many respects and during the past several years has been replacing it in many pharmaceutical and industrial uses. It is non-potable and not open to the abuse that is associated with ethyl alcohol. It is, therefore, free from governmental restrictions and taxation and requires no record of disposition. The absence of denaturants and the high purity of this alcohol overcome many difficulties encountered when denaturants are added to ethyl alcohol. It possesses the additional merit of being inexpensive and at the present time has a cost that is approximately 40 per cent less than tax-free ethyl alcohol.

Isopropyl alcohol has been accepted for many purposes by the Council on Pharmacy and Chemistry of the American Medical Association and has been included in the New and Non Official Remedies since 1936. It was admitted to the National Formulary in 1943 and is official in the present edition of this compendium.

PHYSICAL PROPERTIES

Isopropyl alcohol is a clear, colorless, volatile liquid having a slightly bitter taste. It has an odor characteristic of this alcohol, but lacks the vinous quality of ethyl alcohol. It is completely water soluble and is also miscible with chloroform and ether. It is insoluble in salt solutions. The anhydrous alcohol has a specific gravity of 0.789 at 15°C. It volatilizes at low temperatures and boils at 82.4°C. The freezing point of this anhydrous alcohol is -89.5°C.

In general the physical properties (boiling point, water solubility, solvent powers, etc.) of isopropyl alcohol and ethyl alcohol are very similar. They parallel the solvent properties of the latter for such substances as: aromatic resins, gums, inorganic bodies, many organic compounds and alkaloids. In some instances it acts as a better solvent. For example, 40 per cent isopropyl alcohol is equal to 80 per cent ethyl alcohol as a solvent for many natural and synthetic essential oils.[1]

COMMERCIAL SYNTHESIS AND MANUFACTURE

Although Berthelot[2] first prepared isopropyl alcohol in 1855, it was not commercially made in the United States until 1920 when it became a by-product of the petroleum and natural gas industry.[3] Production is now confined to three manufacturers which produce, annually, a total of approximately 65,000,000 gallons of this alcohol.[4]

The commercial manufacture consists of cracking petroleum which releases olefin gases containing propylene. These gases are absorbed in sulfuric acid and the resulting alkyl sulfuric acids are hydrolyzed. The principal reaction may be represented by the following equations:[5]

$$\underset{\text{propylene}}{CH_3\text{-}CH{=}CH_2} + H_2SO_4 \rightleftharpoons \underset{\substack{\text{isopropylsulfuric}\\ \text{acid}}}{CH_3\text{-}CH(OSO_3H)CH_3}$$

$$\underset{\substack{\text{isopropylsulfuric}\\ \text{acid}}}{CH_3\text{-}CH(OSO_3H)CH_3} + H_2O \rightleftharpoons \underset{\substack{\text{isopropyl}\\ \text{alcohol}}}{CH_3\text{-}CH(OH)\text{-}CH_3} + H_2SO_4$$

Isopropyl alcohol of approximately 91 per cent strength is produced from this reaction. Like ethyl alcohol, it cannot be concentrated beyond a certain point by simple distillation. It is, however, much easier to dehydrate than the former. The 99 per cent product is obtained by a "salting-out" process and further distillation. The water is removed by using water soluble salts such as sodium hydroxide and potassium carbonate. Just prior to the final distillation a small proportion of cupric chloride (suitably 0.5 per cent or less) is used for stabilizing and improving the odor of the alcohol.[6]

PHARMACOLOGY

General

Isopropyl alcohol, when taken internally, is rapidly absorbed from the gastro-intestinal tract and diffuses into the tissues. Here it is partially transformed into acetone before being eliminated from the body.[7] Acetone may be detected in the urine within the first hour and in the breath in fifteen minutes after ingestion of isopropyl alcohol. It may still be quantitatively demonstrated in the urine after forty-eight hours.[8] The isopropyl alcohol that remains in the blood stream disappears from the blood through the excretory organs. That all excretory organs participate in the removal of the alcohol from the blood has been observed following intravenous administration of isopropyl alcohol in dogs. High concentrations of the alcohol were found in the saliva and stomach contents as well as in the urine and breath of the animals.[9]

Effect On Body Functions

The fact that isopropyl alcohol produces no noticeable harmful effects upon the skin has been substantiated time after time by the numerous tests performed on test animals and human beings. Boughton[10] reports that daily application of a 50 per cent solution of isopropyl alcohol to the facial areas of test animals during one hundred eighty-seven days failed to produce injury to skin, hair, or eyes that would differentiate these animals from those treated in a similar manner with tap water. In another test no toxic effects, either local or systemic, were noted when it was applied, undiluted, repeatedly for several weeks to shaved areas on the backs of rats, dogs, and rabbits.[11] Harris[12] made applications of both undiluted and 50 per cent isopropyl alcohol to the arms of several persons. This procedure was carried on twice a day for a period of twenty-five days with no evidence of skin irritation or absorption reported.

A survey of the numerous experimental tests performed on various animals, special organs, and micro-organisms, indicate that there is rather general agreement that the toxicity of isopropyl alcohol is approximately twice that of ethyl alcohol, irrespective of whether the two are given by mouth or by subcutaneous or intravenous injection. There is reason to conclude from these experiments, however, that the ingestion of small quantities of this alcohol does not produce any deleterious effects. Further, that the inhalation of its vapors does not result in subsequent blindness or defects in vision, in contrast to the well-known results of methyl alcohol poisoning.[13]

Loeffl,[14] Fuller and Hunter[15] gave isopropyl alcohol to human subjects in concentrations equivalent to 15 cc. of pure alcohol daily for several days without producing any harmful effects. Headaches were said to have been reported by some of the patients after a few hours; but there was little effect on the respiration and neither exhilaration nor incoordination were experienced. From the results of experiments carried out on animals giving the comparative toxicity of isopropyl alcohol and ethyl alcohol, and from known blood alcohol concentrations of deaths resulting from acute alcoholism, it has been determined that as much as 166 cc. of isopropyl alcohol would probably have to be ingested in order to produce fatal results. However, because of the emetic action of the alcohol it is thought to be unlikely that this quantity would be tolerated as a single dose and that this, along with the depressant effect on the central nervous system, would lessen the probability of ingesting a fatal quantity.[16]

The discovery recently that isopropyl alcohol enhances the anticonvulsant action of diphenylhydantoin has attracted considerable attention. Driver[17] reports that it is capable of increasing the cortical depressant efficiency of this well known epileptic agent without demonstrable evidence of motor depression or narcosis. In testing its ability to raise the threshold for electrical convulsions in rats, it was also found to exert a tremendous anticonvulsant effect without ataxia. Its superiority to other alcohols as an anticonvulsant is thought to be due to its partial transformation to acetone in the body. The possible significance of using isopropyl alcohol for developing new or improving old anti-epileptic agents is now being discussed.

Action On Bacteria

There is evidence from the numerous experimental tests performed on certain bacteria, protozoa, and other low forms of life that isopropyl alcohol possesses a greater germicidal effect and is effective in lower concentrations than ethyl alcohol. It also has the advantage of having a lower surface tension and greater fat solvent action.

There has been some disagreement concerning the concentration at which isopropyl alcohol is most effective as a germicide. Concentrations ranging from 50 to 99 per cent by weight have been reported as strengths at which it possesses its maximum bactericidal properties. Powell[18] and Straughn[19] found that non-spore forming bacteria such as Staphylococcus aureus and Escherichia coli were generally killed in less than five minutes by concentrations of isopropyl alcohol between 50 and 80 per cent by weight. When higher concentrations were used, a longer period of time was said to be required to produce similar results. Others have reported that the bactericidal

effects of the alcohol steadily increases as the strength nears 100 per cent.[20] McCulloch[21] states that it is most active in the 98 to 99 per cent by weight pure state in which it is purchased. These variations are attributed to the different methods employed for determining its effectiveness and to the fact that isopropyl alcohol, like other disinfectants, is used under circumstances not necessarily the same as test conditions.

It should be emphasized that isopropyl alcohol, like ethyl alcohol, cannot be relied upon to destroy sporulating pathogenic microorganisms such as Clostridium tetani, Clostridium welchii, and Bacillus anthracis, which may contaminate some surgical instruments.[22] However, it is destructive to non-spore forming bacteria. In its use for disinfecting instruments, Straughn[19] states that, "isopropyl alcohol is capable of providing clinical asepsis, which is about all that can be said for most chemical agents that are not destructive to metals." Complete bacteriological sterility cannot be guaranteed with any measure short of autoclaving. Since isopropyl alcohol is a strong precipitant of plasma proteins,[19,20] it is essential that instruments be thoroughly cleansed before they are immersed in it. Bacteria present on instruments contaminated with organic matter such as blood, serum, and pus may not be appreciably affected by the alcohol due to the formation of protective coatings of coagulated proteins.[19]

PHARMACEUTICAL APPLICATIONS

General

Since isopropyl alcohol is available in its pure state without added denaturants, is free from burdensome taxes and regulations, and possesses excellent solvent properties, it has been used with advantage to replace ethyl alcohol in many instances. It is recommended for use in the preparation of extracts where the solvent is evaporated, in pharmaceuticals for external use, in diagnostic stains, and in many other uses which will be discussed here.

Burlage and Hawkins[23] report the use of isopropyl alcohol as a menstruum and solvent in ten official galenical preparations which ranked high in frequency of use. From the standpoint of ease of preparation, it was said to be of advantage as a solvent in eight of the preparations studied. By using isopropyl alcohol, tinctures of digitalis and hyocyamus have been prepared that have a greater potency than those made with the official menstruum.[23,24] Harris[12] has used this alcohol in the preparation of certain extracts where the solvent is ultimately evaporated and has found it to be very satisfactory.

The use of isopropyl alcohol in pharmaceutical products for internal use has not been given the consideration that has been given to its use in products for external application. On the basis of pharmacological work carried out, however, it would appear possible to use it in such preparations as mouth washes, gargles, dentrifices, etc., as no harm need be feared from the accidental swallowing of moderate quantities of such preparations containing isopropyl alcohol.[25] It has been found suitable for use in the wetting of tablet granulations and the Food and Drug Administration has allowed its use for that purpose as long as the alcohol is subsequently removed by evaporation.[26]

Use As A Disinfectant

Isopropyl alcohol is rapidly replacing ethyl alcohol for disinfecting purposes and has already done so in many hospitals. It is reported to be almost twice as efficient as the latter as a skin disinfectant. Because of its lower surface tension it also facilitates greater "removal" of bacteria from the skin.[19] During the past fifteen years the University of Michigan Hospital has employed a 50 per cent solution of isopropyl alcohol for preoperative surgical scrub. A 93 per cent solution of this alcohol with 5 per cent propylene glycol and 2 per cent compound solution of cresol added is used by this hospital as an antiseptic solution for soaking various instruments previously cleansed and sterilized. The small water content of this mixture renders it non-corrosive for metal instruments. An instrument sterilizing solution is prepared by the Pharmacy of the above named hospital from the following ingredients:

Isopropyl Alcohol	500.0 cc.
Methyl Alcohol	40.0 cc.
Solution of Formaldehyde U.S.P.	80.0 cc.
Solution Zephiran Chloride Concentrate 12.8%	8.0 cc.
Sodium Nitrite	10.0 gm
Distilled Water, sufficient to make	1000.0 cc.

Add the zephiran solution and the formalin to 300 cc. of the distilled water. Dissolve the sodium nitrite in this mixture. Add the two alcohols slowly with constant stirring. Then add enough distilled water to make the product measure 1000 cc.

Tainter and his associates,[27] who in 1944 developed a similar preparation using isopropyl alcohol, found that complete sterility against common pyogenic organisms was produced after instruments were immersed in the solution from ten to fifteen minutes. It was also found to be non-corrosive to instruments and without dulling effects on their cutting edges.

Since isopropyl alcohol does not effect the po-

tency of insulin, it is employed as a disinfectant in connection with the administration of this agent.[28]

Use In External Medicinals

The use of isopropyl alcohol in preparations for external application is justified from evidence of the safety of its use, its effectiveness in skin sterilization, and its excellent solvent properties. It is possible to substitute isopropyl alcohol for ethyl alcohol in many external medicinals, because the physical properties of the two alcohols are so similar. Experimental formulations of the official liniments of camphor and soap, and soft soap were carried out by Clouse and Bamford.[29] They found that by using isopropyl alcohol the cost of these two preparations was less than that of the same products made with specially denatured alcohol. Their proposed formulas are as follows:

Liniment of Camphor and Soap

Hard Soap, dried and granulated or powdered	60 gm.
Camphor, in small pieces	45 gm.
Oil of Rosemary	10 cc.
Isopropyl Alcohol	700 cc.
Distilled Water, sufficient to make	1000 cc.

Liniment of Soft Soap

Medicinal Soft Soap	650 gm.
Oil of Bay	10 cc.
Ethyl Oxide	20 cc.
Isopropyl Alcohol, sufficient to make	1000 cc.

Two per cent ether is added to the latter preparation to help disguise the odor of the alcohol. For both formulas the procedure is the same as for the official preparations. Harris[12] in using isopropyl alcohol in place of ethyl alcohol in tincture of iodine found such a tincture to be almost identical with the official product as far as physical properties and external usefulness are concerned. This alcohol is used in many hospital pharmacies to replace ethyl alcohol in such external medicinals as: tinctures of benzoin, benzyl benzoate, larkspur, and zephiran; spirits of camphor and formic acid; liniment of soft soap, chloroform liniment, solution of coal tar, and in various "scalp tonics" and therapeutic shampoos.[30,31] The official preparations which have isopropyl alcohol substituted in their formulas should not be designated by official titles.

Isopropyl alcohol is also suitable for the preparation of massage solutions and is sold commercially as a massage alcohol compound. Since it is not subject to irregular use, it is free from governmental restrictions. The Food and Drug Administration, however, recommends that the label should bear the phrase "Isopropyl Alcohol Rubbing Compound" rather than the phrase "Isopropyl Rubbing Alcohol Compound" in order to prevent confusion and distinguish preparations containing isopropyl alcohol from those containing ethyl alcohol which are subject to regulations.[1] A "Back Lotion" based on the following formula is being used by the University of Michigan Hospital and a similar preparation has been recommended in the Journal of the American Medical Association.[32]

Isopropyl Alcohol	500.0 cc.
Propylene Glycol	20.0 cc.
Glacial Acetic Acid	1.0 cc.
Distilled Water, sufficient to make	1000.0 cc.

Coloring and perfume may be added

"Isopropyl Alcohol Rubbing Compound" is official in the present edition of the National Formulary. It contains not less than 68 per cent and not more than 72 per cent of isopropyl alcohol by volume.[33]

The use of isopropyl alcohol in cosmetics dates back as early as 1921.[3] For this purpose it has been found to be a desirable substitute solvent. In 1943 the Alcohol Tax Unit of the Internal Revenue Department granted cosmetic manufactures permission to use it along with ethyl alcohol in the manufacture of toilet preparations.[34] It is especially desirable as a substitute in those preparations in which its odor is neutralized by means of such aromatic chemicals and essential oils as: linoallol, vanillin, coumarin, linalyl acetate, and methyl paracresol. Today, with a tendency toward the use of isopropyl alcohol in cosmetics, prepared "maturing" agents or "modifiers" and "masking" agents are available.[35] These preparations are capable of altering the odor of the alcohol and permit its use in those cosmetics in which its odor would otherwise be objectionable. Isopropyl alcohol having the highest purity (99 per cent) will produce acceptable after-shave lotions such as the familiar eau de cologne, lilac, and bay rum.[36] The following formula has been suggested for its use in a bay lotion:[1]

Sodium Borate	10.0 gm.
Oil of Myrcia	15.0 cc.
Oil of Pimento	0.5 cc.
Oil of Sweet Orange	2.0 cc.
Rum Essence, artificial	2.0 cc.
Isopropyl Alcohol (91%)	440.0 cc.
Distilled Water, sufficient to make	1000.0 cc.

Dissolve the sodium borate in 200 cc. of the distilled water and dissolve the aromatics in the alcohol. Add the aqueous solution to the alcohol solution. Then add enough distilled water to make

the product measure 1000 cc. Chill the mixture and filter with the aid of purified talc.

Isopropyl alcohol has also been used in such hygienic and cosmetic preparations as: liquid deodorants, protective creams, hair lotions, sunburn lotions, and a variety of hand, face and foot lotions. An example of its use in such preparations is the following scabicide lotion:[37]

Benzyl Benzoate Lotion

Stearic Acid	33.0 gm.
Propylene Glycol	26.0 cc.
Hydrous Wool Fat	13.0 gm.
Cetyl Alcohol	13.0 gm.
Triethanolamine	6.0 cc.
Benzyl Benzoate	330.0 cc.
Deodorized Isopropyl Alcohol, (15%) sufficient to make	1000.0 cc.

Heat the stearic acid and triethanolamine together on a water bath for fifteen minutes. Add the lanolin, propylene glycol, and cetyl alcohol and heat until melted. Then add the benzyl benzoate. Heat the diluted alcohol to the same temperature as the oily mixture and add it to the oils slowly with constant stirring. Finally, pass the lotion through a homogenizer.

INDUSTRIAL AND OTHER USES

Acetone of high quality is produced from isopropyl alcohol. During the war 64 per cent of the total amount of this alcohol manufactured was used to produce acetone which was employed to absorb acetylene gas necessary for welding ships and for other war necessities.[4] Isopropyl alcohol is readily converted to acetone by passing it over catalysts such as catalytic oxides. Hydrogen of high purity is also obtained as a by-product from this reaction.[1]

It is also an important source of thymol, which is produced by reacting isopropyl alcohol and aromatic hydrocarbons or phenols together with a variety of catalysts. The thymol thus obtained possesses all the properties of the natural product.[38]

It is also used extensively as an industrial solvent in preparing leather dyes, inks, insecticides, and liquid and transparent bar soaps. In combination with methyl alcohol, it is used as an antifreeze and meets all the requirements of a modern antifreeze for automobile use. It is added to gasoline to prevent separation of water, which would result in freezing in cold regions. Hydraulic brake fluids using isopropyl alcohol have been found to be stable, non-corrosive, and good for all weather service.[1] It is used alone or in combination with carbon tetrachloride as a cleaning and spotting liquid. "Rapid acting" glass cleansers have been prepared from solutions of isopropyl alcohol.[1] The following formula will produce an efficient glass cleanser:

Sodium Lauryl Sulfate, U.S.P. XIII	0.25 gm.
Methylene Blue Solution, 0.25%	0.20 cc.
Isopropyl Alcohol	300.00 cc.
Distilled Water, sufficient to make	1000.00 cc.

Dissolve the sodium lauryl sulfate in 100 cc. of the distilled water. Add this solution and the dye solution to the alcohol. Then add enough distilled water to make the product measure 1000 cc.

Isopropyl alcohol fulfils practically all the requirements of a solvent for use in bacteriological and pathological work and has already replaced ethyl alcohol for this purpose in many laboratories.[3,39] It is employed in the preparation of many laboratory stains and reagents.[30] A satisfactory gentian violet solution used in the Gram's method of staining is prepared with this alcohol as follows:

Crystal Violet	1.0 gm.
Ammonium Oxalate	0.8 gm.
Isopropyl Alcohol	20.0 cc.
Distilled Water	80.0 cc.

Dissolve the crystal violet in the isopropyl alcohol and the ammonium oxalate in the distilled water. Filter each solution separately. Then, with constant stirring, add the dye solution to the aqueous solution.

Carbol-gentian violet, alkaline methylene blue, and carbol fuchsin are examples of some of the many other stains prepared with this alcohol. The guaiac test, which is used to detect "occult blood" such as the presence of blood in the urine, involves the use of a reagent that may be prepared by dissolving guaiac resin in isopropyl alcohol in the following proportions:

Guaiac	2.0 gm.
Isopropyl Alcohol	100.0 cc.

Isopropyl alcohol in combination with 3 per cent hydrochloric acid U.S.P. produces an efficient acid-alcohol solution used as a decolorizing agent in the staining of acid-and alcohol-fast bacteria. It has also satisfactorily replaced ethyl alcohol in the acetone-alcohol solution employed as a decolorizer in the Gram's method of staining.

It has been used with success in dehydrating histological material and in preserving anatomical and pathological specimens.[39] It is superior to ethyl alcohol for the preparation of Wasserman

Antigens and yields a product of superior antigenic power.[40] It is also of value as a cleaning and drying agent for glassware and other laboratory apparatus.

SUMMARY

Isopropyl alcohol is an inexpensive by-product of the petroleum industry with properties very similar to ethyl alcohol.

Ingestion in moderate quantities does not produce exhilaration, and this together with its bitter taste minimize any tendency toward abuse. It is therefore, non-potable as a beverage, free from taxation, and is not subject to the extensive bonds and responsibilities required in the use of tax-free ethyl alcohol. It also possesses a lower surface tension, greater fat solvent action, and a more rapid killing power on many organisms than does ethyl alcohol.

The similarities between isopropyl alcohol and ethyl alcohol permit the replacement of the latter for many purposes. The differences offer opportunities for new uses and new products.

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PREREQUISITES FOR HOSPITAL PHARMACY INTERNS *

THE SECOND OF A SERIES OF PAPERS DISCUSSING THE SUBJECT OF INTERNSHIPS IN HOSPITAL PHARMACY

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The qualifications we expect in the hospital pharmacy intern have for a long time been a topic for discussion whenever hospital pharmacists convene; however, if one of us has ever spoken in an assembly along these lines, I am not aware of it.

I hope that through this discourse we will be stimulated to influence the inevitable change in the educational preparation of future hospital pharmacists. It is hoped that as these recommendations and suggestions are made, it will not be construed that I entertain the impression that I am impeccable or that these ideas represent the best final solution to the insecurity which the present over-all pregraduation picture presents.

I do not know that any other group of practicing pharmacists has dared or even cared to dictate or influence the choice of curriculum, the selection of students and the instructors for these students. I do know that pharmacy educators have for years bandied the question around impressive conference tables; but they have as yet reached no conclusion that will convince even themselves. Why? I wonder if the fact that these educators are themselves so divorced from the actual problems as they exist theoretically and practically in the pharmacist's laboratory has anything to do with it. I wonder, further, if their failure to seek advise from the ranks of practicing pharmacists has had any deterring influence.

I know we are agreed that to continue to progress and satisfactorily fulfill our place in pharmacy, we must produce competent men and women for the many vacancies that are and will be existing in hospital pharmacy. We must consider it our obligation to see that these people profit by our discoveries and mistakes. Now, we are in a position to say what was wrong and what was right about our college work to a much greater degree than are those who are not practicing.

Let's consider the future of hospital pharmacy from an embryonic point. We remember the days, not necessarily war years when many pharmacy schools were struggling for students—just students—to justify their existence. I feel that the schools were fully aware of the type material they were admitting and discharging. Now that there are more than enough students to fill all the schools, educators everywhere are urging that students be admitted according to a predetermined sufficiently flexible standard. The system becomes immediately complicated when admission is based solely upon high school curriculum due to the vast number of high schools and an equal vastness of curriculum variance. Therefore, selection must be based not only upon scholastic status but also upon the psychological make-up of the individual. Much research has been done along these lines and it is important that we have recourse to this authority.

It would seem desirable that the student entering a college of pharmacy be expected to have completed successfully a high school course which would include four years of mathematics, at least two years of language with history, economics, English, and science in standard amounts. In addition, some elementary business courses particularly typewriting, bookkeeping, shorthand, and business English would appear indispensable. Surely, these are assets in any trade or profession. They may be regarded as fundamental study and work aids not only after but during the college years as well. In this connection, visualize the pharmacist or intern who must learn

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*Presented at the 1947 Institute on Hospital Pharmacy Chicago.

to use the typewriter before he can write an acceptable label.

The physical ability should be such that would be compatible with any non-sedentary occupation and the applicant should be forewarned of the physical, social, and spiritual requirements expected of a pharmacist in the execution of his duties.

A neat appearance is of prime importance and a personality that is sufficiently flexible is necessary to deal smoothly with both subordinates and superiors and the great variety of patients in the many states of health and disease.

All of these factors must be given due cognizance in the selection of students of pharmacy since it is not usual that a student enters pharmacy school with a definite idea of the branch of the profession he will pursue.

It seems that there is a prevalent opinion that pharmacy curriculums in general are outdated and inadequate. The reasons, basically, as presented by Dean Rowe of Rutgers University (American Druggist, August, 1946) are:

1. The deplorable outdated state of the pharmaceutical syllabus which most schools follow and mistakenly think it is a requirement.

2. The inadequacy of textbooks, even the modern ones are usually not up to requirements.

3. Lack of initiative, ability and time of much of the faculty to depart from the established pattern.

4. On licensing examinations, State Boards require the knowledge of outdated material, therefore the colleges feel responsible for teaching such material.

5. There are too few teachers making it necessary for them to teach too many courses too many hours a day. Therefore specialization is impossible, so disinclination results from overwork.

6. Finally, there is a great need for more financial support of schools.

Judging from this and similar articles, it becomes difficult to apprise ourselves of the instances wherein the curriculums are adequate: not enough English; not enough language; not enough mathematics; not enough psychology and economics; often no physics; not enough chemistry or biology, inadequate physiology and pharmacology; too much pharmacognosy, Latin; galenical and inorganic pharmacy.

I am glad to hear, however, that some schools have revised their programs in the last few years, correcting to some degree their inadequacies and inconsistencies. The ideal curriculum for a hospital pharmacist, and it is thought that it should not differ for a retail pharmacist if he performs pharmaceutical duties, obviously has not been devised. Such a curriculum must be a dynamic thing. Ideality cannot be achieved by the employment of antiquated tools, books, and teachers.

I would like to discuss with you briefly a curriculum which appears to approximate the requirements of a pharmacist today. It is designed so that the student would acquire a basic scientific understanding and comprehension during the first two years so that pharmacy will come as a course of study which is superimposed upon necessary prerequisites, not as a course in which the prerequisites must be fulfilled by rote. To do otherwise, it seems to me, is as unsound as advising the study of quantitative analysis before the study of general and qualitative chemistry.

The pharmacy of this curriculum has been planned to eliminate the divorcement of such things as arithmetic and Latin from manufacturing and prescriptions; and after one has had the fundamentals of chemistry, for example, general qualitative, quantitative, organic and physical, it seems unnecessary to separate their pharmaceutical equivalents, when they are so logically related, at least at the undergraduate level. Cannot the student integrate his thinking more effectively if the qualitative test for atropine, its physical and chemical properties and its quantitative determination in belladonna are studied simultaneously? By the same token, cannot a more comprehensive understanding of the chemistry of arsenic result from the simultaneous study of its inorganic and organic combinations?

I notice that some schools have elected to give a separate course in the use of specialized equipment. Here it would appear that these schools have overlooked the fact that a most effective plan would be to have the student learn the equipment as he uses it in his chemistry or pharmacology or dispensing courses.

It might be well that we as practicing hospital pharmacists give this business of curriculum some serious thought. What if we are asked for suggestions. Let's study this one now, and you can, individually or collectively, take up from there.

Extracurricular professional activities do much toward making the student into the sort of individual he is expected to be after he leaves the protective fold of the classroom. Here again, the vein of these activities depends largely upon the resourcefulness of the faculty, as does the success

A SUGGESTED PHARMACY CURRICULUM
(by Leo F. Godley)

First Semester		Second Semester	
	FIRST YEAR		
Course	Credit	Course	Credit
English (grammar)	3	English (composition)	3
Mathematics (algebra)	3	Math. (trigonometry)	3
Language	3	Language	3
Chemistry (general I)	4	Chemistry (general II)	4
Biology (general)	4	Biology (botany)	4
	17		17
	SECOND YEAR		
English (literature)	3	English (elective)	3
Mathematics (diff. calculus)	3	Math. (integ. calculus)	3
Language	3	Language (scientific)	3
Chemistry (qualitative)	3	Chemistry (quantitative)	3
Chemistry (organic I)	5	Chemistry (organic II)	5
	17		17
	THIRD YEAR		
Biology (anatomy)	4	Chemistry (Biochemistry)	5
Chemistry (physical)	3	Chemistry (Physical)	3
Physics	4	Physics	4
Pharmacy I	5	Pharmacy I	5
	16		17
	FOURTH YEAR		
Physiology	5	Physiology	5
History (modern)	3	History (world government)	3
Economics	3	Psychology	3
Pharmacy II	5	Pharmacy II	5
	16		16
	FIFTH YEAR		
Pharmacology	6	Pharmacology	6
Biology (bacteriology)	5	Library	3
Pharmacy III	6	Pharmacy III	6
	17		15
TOTAL SEMESTER CREDITS:	165		

SUMMARY

ENGLISH (12 credits): grammar, composition, American literature, elective.
MATHEMATICS (12 credits): algebra, trigonometry, differential calculus, integral calculus.
LANGUAGE (12 credits): including one-half year scientific.
CHEMISTRY (35 credits): general, qualitative, quantitative, organic, physical, biological.
BIOLOGY (17 credits): general, botany, bacteriology, anatomy.
PHYSIOLOGY (10 credits): human.
PSYCHOLOGY (3 credits): general.
PHYSICS (8 credits): general.
ECONOMICS (3 credits): general.
HISTORY (6 credits): modern, world government.
PHARMACY I (10 credits): history, Latin, arithmetic, technic, manufacturing in small and large quantities.
PHARMACY II (10 credits): pharmaceutical chemistry (organic, inorganic, qualitative, quantitative).
PHARMACY III (12 credits): dispensing, incompatibilities, N.N.R., jurisprudence.
PHARMACOLOGY (12 credits): pharmacognosy, posology, toxicology, bioassay.
LIBRARY (3 credits): reading, writing, comprehension.

of the entire curricular program. One of these activities that is responsible for the incipience of mental inquisitiveness is discussion group participation. Groups that are small and informal are the recommended type. Topics for discussion present themselves readily once the habit is begun. This type of session even among our own Society members, in addition to meetings of the local affiliated groups, would be extremely beneficial. I hope that there will be some of these discussions during our meeting here.

Membership in school professional organizations such as the student A. Ph. A. branch, but not to the exclusion of their social equivalent, is another extracurricular activity which helps to give the student polish and perspective. It would seem advisable to urge the senior students to attend the national pharmaceutical conventions. There is nothing like a convention and meeting people from the various localities who are professionally enthusiastic to produce the necessary contagion.

Observation in the various industrial establishments such as retail stores, hospitals, commercial manufacturing and city public health laboratories has been found valuable to the student. Here, we as hospital pharmacists can do our part in this scheme by arranging group visits for students with the school administration. It would be well if each senior student were required to visit a certain number of each of these establishments.

The last of the extracurricular activities I have chosen to mention is the library. Any faculty can consider its job a bad one if it has not instilled into the student not only the necessity for, but the desire for reading and study of the periodical literature. If as a student, this habit can be formed, and its value understood, as a practitioner the satisfaction derived in solving problems and above all in recognizing the existence of a problem, will be easily recognizable.

With the course completed and the degree awarded, the student is ready to undertake the practice of his choice. He is well qualified for all of them, be it retail, or hospital, or graduate study. The curriculum outlined is equivalent in credit hours to a Master of Science Degree. What the talked about five year course leads to in degree has not been decided and at this point is of minor importance. Indeed, the University of Illinois is now considering requiring an additional 15 to 20 credit hours for graduation, thus making a five-year course in engineering, education, journalism and other professional curriculums mandatory. What we are interested in primarily is equipping the student for practice. With this curriculum it would appear that he would be able to enter a pharmacy as an intern with the assurance that his practical experience, if well guided, will culminate in an ability to practice pharmacy in the fullest sense, rendering a real service with a real satisfaction. If graduate study in pharmacy, chemistry, or any biological science is elected, with this suggested curriculum, the student should be permitted to enter any type institution without being required to do extra undergraduate work to qualify for entrance.

If the graduate's choice of practice leans toward hospital pharmacy, it becomes his duty to choose a hospital in which to obtain his practical experience for licensure. This should bear the same significance as the choice of a college. It would be advisable to choose a hospital pharmacy that has a definitely planned internship program. The staff in this pharmacy should have a general academic background at least equal to his own. If the curriculum we have just advanced has not been obtained, it would be well to choose a teaching institution connected with a university wherein arrangements have been made to permit some academic study. The courses that are applicable are quite lengthy and require much time in the classroom and laboratory. More than one year would be necessary to obtain the required practical experience and pursue an academic program. In the absence of the much needed A.S.H.P. approved list of hospital pharmacies, it would be safe at this point to say that the choice of a department in which to pursue an internship should be one that can offer a program that is similar to that outlined by Mr. Clarke.

METHADON

- Continued from page 137

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Stills AND PYROGEN-FREE DISTILLED WATER

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The May-June issue of THE BULLETIN shows some modern stills suitable for and within the province of fairly large size, well organized hospitals. Alas, there are many hospitals of smaller size or just moderately large where it is quite difficult to convince the administrators that a large size semi-automatic still is a good investment.

It seems to the writer that this subject is a much larger one than just getting a still. There is no reason why a small size institution should not solve this problem in a satisfactory manner—often by redesigning the replacement and set-up of present equipment or utilizing the more modest smaller scale installations. The approach should be primarily on a strictly engineering basis. This applies to larger institutions as well as to the smaller ones.

WATER SUPPLY

The first thing to consider is the water supply to be used in the production of the distilled water. Find out if it includes undesirable gases, including chlorine, or iodine; if it is a naturally soft water and if it is continuously such. If it is a hard water determine its type of hardness. Is it subjected to community or to institutional softening processes? Is it a precipitation sedimentation, or a filtration process, or a zeolite-salt regeneration system or one of the newer anion-cation conversion systems. Determine the cost of 1,000 gallons of the water as delivered at the faucet.

HEAT SUPPLY

The available and probable heat source to be employed should be the next considered. In some large plants waste steam or super-heated steam might be an economical source of heat. In some section of the country gas heating, and in others electrical, and even oil heating may be the available and the most economical source. Sometimes the choice will depend upon which is most used in the institution and upon the differential in rates.

INSTITUTIONAL REQUIREMENTS

The next factor to consider is the probable maximum need of the institution. To arrive at this the therapeutic trends, the present use and planned expansion of the X-ray department, of the laboratories and of other services which may require or use distilled water to advantage are to be considered.

TYPES and LOCATIONS of INSTALLATIONS

At present most still installations in smaller institutions are haphazard and unplanned or poorly planned. This will be more extensively discussed later. The types of stills available, their capacity rating and costs should be ascertained.

SURVEY of PRESENT INSTALLATIONS

It would be of much value if the American Society of Hospital Pharmacists could get its members to make a survey of the relative efficiency of the present installations to produce five or ten gallons of distilled water. This can be done as follows:

1. By noting accurately the time required to obtain 5, 10, or 15 gallons of spent water at the drain end. Note these as the factors "A" for the time, and "X" for the number of gallons measured.
2. Determine the time required to produce 5 or 10 gallons of distilled water. Note these as the factors "B" for the time and "Y" for the number of gallons measured. Then:

$\frac{\text{B times X plus Y}}{\text{A}}$ will give the gallons used to produce "Y" gallons or $\frac{\text{Gallons used}}{\text{Y}}$ the gallons used to produce one gallon of distilled water. This gives you the time and water cost.

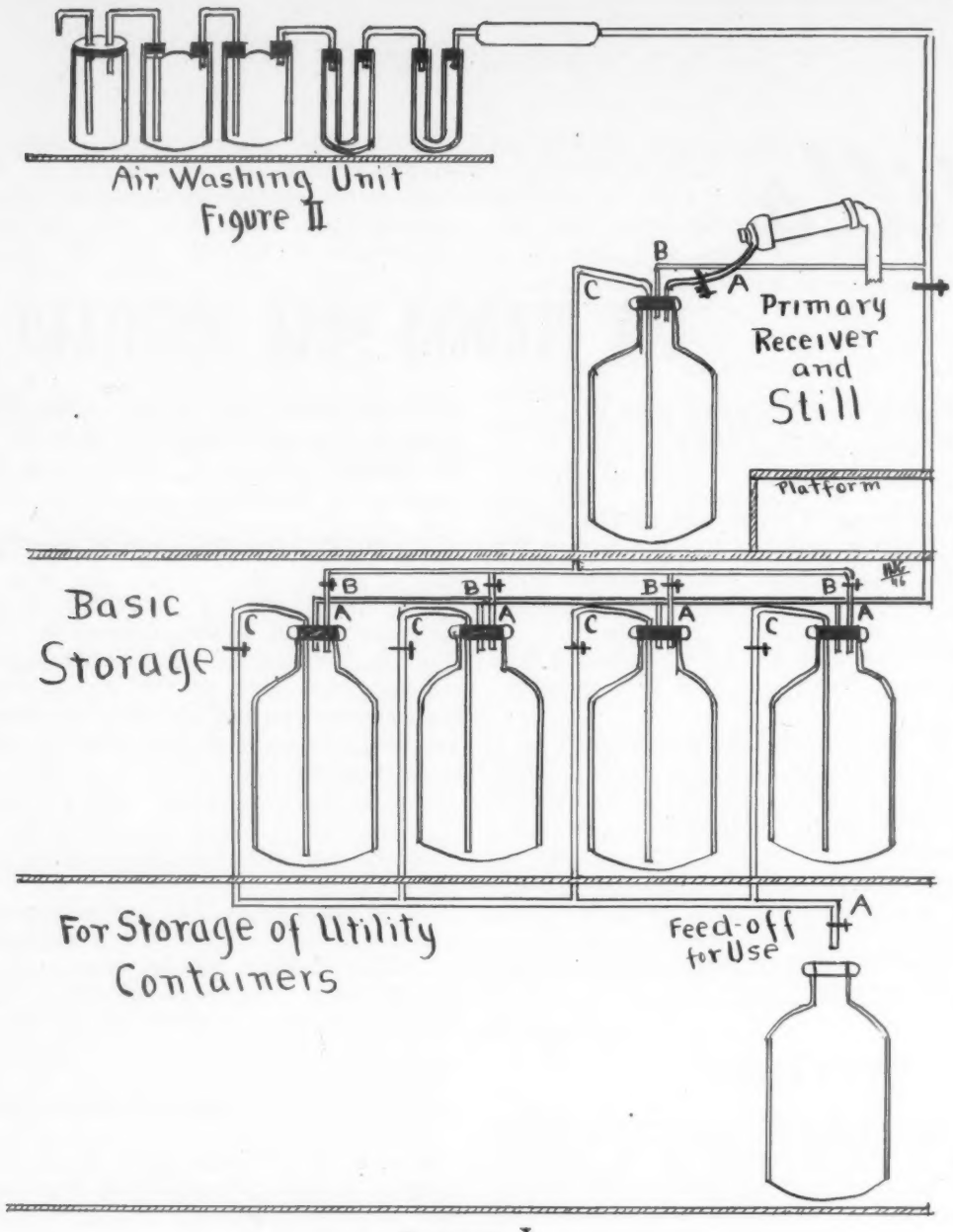


Figure I

3. Secure from your plant engineer or from the gas or electric utility engineering department the probable cost with the heating unit used for the time necessary to produce the test volume of distilled water. You then have the power cost factor. These combined figures do not include depreciation of the installation or of accessory equipment, or of labor, or rental, or storage space value. Much of constructive value will result from such a survey of the present installations.

INSTALLATION PLANNING

Since the primary reason for investing in a still today is to assure an ample supply of pyrogen-free sterile water, the installation must be such as will assure this. From stills of the Barnstead and Stokes types the water as delivered from the still is or should be sterile and pyrogen-free if the still is properly installed and used. Stills are so constructed as to avoid carrying dust (and spore) contamination over with the vapors. Any contamination will be the fault of the installation and of its supervision.

In most smaller institutions the most serviceable method to collect and to store the sterile distilled water is in five-gallon containers. A ten-gallon container may, in some installations, be better for the primary receiver. The number of containers required will depend upon the number of gallons necessary for a minimum reserve supply.

All primary collection and storage containers and all transfer tubing should be of Pyrex or similar glass. Service containers can be of the ordinary type usually used for distilled water

supply. A minimum of flexible tubing should be employed. It should be of short lengths to produce a reasonable degree of flexibility and ease in assembling and in dismantling when necessary. The newer type of non-rubber tubing is to be preferred. Some means for sterilizing in place as an additional precaution by means of a heat jacket on the primary container would be desirable.

In figure 1 is shown a somewhat sketchy outline of what the writer considers a basically correct installation for the average smaller hospital or laboratory requiring such a supply of water. The inflow assemblys are designated "A"; the air-vents "B" and the outlet units "C", these are essentially the same for all storage units.

STOPCOCKS. The stopcocks or shutoffs are considered essential where indicated by the symbol ⊣⊢. The one between the still delivery arm and the primary receiving unit should be a two-way stopcock to permit running off the first pint or so of distillate when starting the still as an added precaution to clear the condenser. This stopcock is essential when the still is not functioning to avoid aspirating unfiltered air (and dust) into the still and thereby into the primary receiving flask. Slovenly, careless supervision and failure to check and adjust this properly may cause trouble. It is advisable to get these with generous sized bore even if it is necessary to have them bored to order.

AIR-VENTS "B". In smaller very limited used installations individual, comparatively simple air-vents can be constructed and installed by using two-bulb drying tubes packed lightly with nonabsorbent cotton, calcium hydrate and glass wool and having the opening downward to help keep out the dust.

This unit should be distinctly higher than the bend of the outlet tube to prevent the water level reaching the filter material. In the simpler installations a glass stopcock should also be installed with each of the storage units to avoid mishaps. A much better installation is a shelf arrangement well above the entire installation composed of a series of filter (drying) tubes, two-neck Woulff bottles and U tubes, all connected in series to the two basic storage levels by copper, tin or lead tube (See Figure 1) This is nothing more than an adaptation of the standard gas or air washing assembly. The Woulff bottles are charged with a maximum depth of concentrated sulfuric acid to remove ammonia and air borne organisms which might pass the primary dust filter. The author considers dry air filtering preferable here to water washing. The calcium hydrate tubes are chiefly to remove possible acid vapors. If this sort of an installation is used, only one stopcock need be installed directly below the take-off arm for the primary receiving flask.

FEED OFF or OUT-FLOW UNITS "C". These like all syphons should be near the bottom of the upper level flasks and only just through the stopper of the lower flask. The bend especially for the primary assembly should be lower than the infeed and air-vent and preferably in a plane slightly up-grade from the flask. This is on the principle of the Soxhlet extractor to insure automatic syphonage by the water level. All connections can be by standard right angle tubes and T tubes.

ASSEMBLY OF INSTALLATIONS

The assembly should be a three shelf or three level affair-that is without counting the air washing unit above the installation. The still and primary receiver should be open and observable at all times. The two lower levels can be enclosed with doors. The lowest shelf is for the feed-off and storage space for service containers either full or empty.

When gas is the heating fuel the still should be vented or flued out of the room. Whenever possible electric heating is to be preferred. The gas pressure, in the authors experience, fluctuates too much for efficient functioning. A multi-point rheostat switch is desirable.

It seems almost needless to state that all parts through which the sterile water will pass and be stored should be clean and sterile.

SPECIAL PROBLEMS and PRECAUTIONS

Chlorinated and iodized and seasonal odored water supplied present special problems as do hard water scaling in the still. The first three may be removed by boiling or heating before use. Descaling instructions are usually supplied by the manufacturers. These however usually do not take into consideration many precautions necessary for a biological water supply. The water should be tested at reasonable intervals for pyrogens. The laboratory service of many hospitals or local Department of health laboratories may be equipped to readily do this, or the pharmacist if conversant with such procedures can do the testing himself.

THYROID INHIBITORS

BY CHARLES WAGNER, PHARMACIST
THE LUTHERAN HOSPITAL OF MANHATTEN
NEW YORK CITY

A DISCUSSION OF THE DEVELOPMENT OF THE ANTITHYROID DRUGS INCLUDING PROPYLTHIOURACIL

The discovery of the various thyroid inhibitors - thiourea, thiouracil and their derivatives - is the direct result of a chance observation of the goiterogenic effect of sulfonamides on rats, made by Mackenzie and McColum in 1941.

The action of these sulfur compounds, now under continuous and intensive investigation for more than three years, has been the subject of an ever increasing number of reports, all of which attest to their positive therapeutic value in thyrotoxicosis.

Instances of unfavorable reaction have been reported. These have served to curb over-enthusiasm, but they have not interfered with the orderly progress tending to establish the true therapeutic value of these new chemicals.

It has been definitely established that the physiologic action of these compounds is to block or inhibit the formation of thyroxin. They do not interfere with the action of the thyroxin already formed. Hence it is that their inhibitory action does not become manifest until the thyroxin already formed has been completely used up, or has undergone decay.

A recent communication from Reveno of the Department of Medicine, Harper Hospital, reports treating twenty thyrotoxicosis cases with thiouracil. Nineteen responded favorably; only one was resistant to the drug.

Treatment was begun with a daily dosage of 0.8 gram, divided into four equal doses. This was subsequently reduced to 0.6 gram daily divided into three equal doses. This in turn was reduced to 0.4 gram daily, then to 0.2 gram daily, as the basal metabolic rate descended to zero or a minus level.

A maintenance dose of 0.1 to 0.3 gram daily was sufficient to maintain the basal metabolic rate between minus 10 and plus 5 per cent. An unfavorable reaction was noted in only one patient, but all symptoms disappeared when treatment was discontinued.

This, however, is taking us ahead of our story. We should really begin with Astwood and his associates, who did the lion's share of the work in this most interesting and promising field, and who were the first to try thiourea and thiouracil in the treatment of human thyrotoxicosis.

In 1943, after testing more than 100 compounds, Astwood reported that two of these compounds proved capable of inhibiting the endocrine function of the thyroid gland. These two were thiourea and thiouracil.

The administration of these agents of experimental animals was followed, after a short latent period, by a lowering of basal oxygen consumption, a decrease in the rate of growth and development, and a diminished food intake - all changes consistent with a state of hypothyroidism.

As these two compounds appeared to be the most promising from a clinical point of view, he employed them in his first studies on normal persons and on patients with hyperthyroidism. Summerizing these early experiments, Astwood wrote:

"The daily administration of 1 to 2 Gm. of thiouracil to hyperthyroidal persons resulted in relief of symptoms and the return to normal of the serum cholesterol and the basal metabolic rate."

He observed a latent period of from one to two weeks before favorable results began to manifest themselves, a sustained remission during treatment and a return to hyperthyroidism when therapy was discontinued.

In a subsequent communication, Astwood observed that, while thiouracil was being used extensively in the treatment of hyperthyroidism, there was one drawback to its use, and that was the occasional incidence of toxicity. One of every 100 patients developed agranulocytosis.

He next resorted to thiobarbital, which differs from barbital only to the extent that one oxygen atom is replaced by an atom of sulfur. His conclusion concerning this sulfur compound was that, while it proved to be twice as active as thioura-

*Presented at the meeting of The Wm. H. Luckett Medical Association of the Lutheran Hospital of Manhattan, March 14th, 1947.

cil in inhibiting the thyroid secretion in man, it was also more toxic than thiouracil when the minimal effective dose was exceeded.

Continued investigation of compounds which inhibit the function of the thyroid gland - about 300 in number - has revealed to Astwood that appropriate substituents in the thiouracil molecule confer a greatly increased activity.

The compounds ethylthiouracil and propylthiouracil are among a group which are approximately ten times as active as thiouracil when tested in rats. Tests have also shown that these thiouracil derivatives exert a more lasting effect following a single dose than thiouracil, a substance known to be rapidly eliminated from the body.

Having found these two compounds satisfactory from the laboratory point of view, Astwood and Vander Loon proceeded to test their effectiveness in human beings suffering from hyperthyroidism. The small dose that proved effective and the favorable results they obtained convinced them that ethylthiouracil and propylthiouracil are well suited to clinical uses.

A total of 43 patients were treated - some with ethylthiouracil and some with propylthiouracil. The effective therapeutic dose was found to be 25 mg. at eight or twelve hour intervals. This was sufficient to restore metabolic equilibrium. A daily dose of 25 to 50 mg. was found adequate to maintain this equilibrium. In humans these compounds proved to be five times as active as thiouracil and far superior to it in the treatment of hyperthyroidism.

Only one untoward reaction occurred in this series of cases. After 42 days of treatment, one patient developed a generalized pruritus accompanied by urticarial eruptions on the body and extremities. This disturbance was cleared after the drug was discontinued, only to reappear when treatment was resumed! It was subsequently learned that this patient had on previous occasions developed hives from eating certain fruits.

This encouraging report on the treatment of thyrotoxicosis, which appeared in the Journal of Clinical Endocrinology in 1945, was followed by another interesting paper on the subject in the November 1946 issue of Annals of Internal Medicine. This report is based upon observation of a series of 100 cases of hyperthyroidism treated with propylthiouracil during the twelve-month period extending from April 1945 to April 1946. With few exceptions, treatment was carried on without bed rest or significant reduction of activity.

The earlier portion of these studies concerned itself mainly with determining the minimal effective dose. As a consequence, many patients received doses which were later regarded as inadequate. The majority of the first seventy cases received an initial dose of 25 mg. every eight hours. In one-quarter of these patients, the dose was subsequently increased to 100 or 150 mg. daily. The majority of the last thirty cases received 100 to 150 mg. daily as an initial dose. The rate and degree of response were significantly more satisfactory in this group.

Close study and observation led Astwood to the conclusion that an initial daily dose of 150 mg. of propylthiouracil is appropriate for severe and moderately severe cases of hyperthyroidism and that smaller doses such as 75 or 100 mg. daily might be used in milder forms of the disease. However, he stresses the need of studying the response of the individual patient and regulating the dose accordingly.

No significant side effects were observed in this series of cases. As in any group of patients under observation for prolonged periods of time, many illnesses of one kind or another developed in some during the course of therapy. With the possible exception of itching of the skin with or without a mild urticarial rash, these episodes followed no recognizable pattern. Transient itching of the skin was noted by four patients, and in two of these a frank urticarial eruption was seen. In only one case was the drug stopped, and in this case treatment was resumed in 48 hours and continued for 3 months without a recurrence of the symptoms.

COVER PHOTO

NO CIGARETTES, ICE CREAM SODAS, or razor blades could be purchased in this early colonial apothecary shop! Dating back to 1793, shop and contents valued at $25,000 by antiquarians have been restored by Smith, Kline & French Laboratories, of Philadelphia, to greet 10,000 physicians of the American Medical Association at their 100th anniversary convention in Atlantic City June 9 to 11. John Gerhard, curator, discusses early American simples, remedies, herbs, chemicals, and botanicals with Miss June Tucker posing in a costume of 1847.

Therapeutic Trends

New Trends in Medicine and Pharmacy Include HISTAMINE IN PERIPHERAL VASCULAR DISORDERS - NEW ANALGESIC AN-148 - URETHANE IN LEUKEMIA - SALICYLAMIDE AND DERIVATIVES AS ANALGESIC AGENTS

HISTAMINE IN PERIPHERAL VASCULAR DISORDERS

Administration of 1(-) histidine monohydrochloride simultaneously with sodium ascorbate has been found to relieve the pain associated with peripheral vascular disease according to a preliminary report in the Journal of the American Medical Association (March 1, 1947). Eleven patients were treated using this therapy and all have responded favorably and have not required amputations.

The possibility that histamine or substances like histamine may play a normal part in bringing about capillary dilatation, and with it an increase in permeability, was suggested when it was found that histamine was released during the period of diethyl ether administration. Previous reports showed that the intravenous administration of diethyl ether for the treatment of impending ischemic gangrene and other peripheral vascular disorders resulted in desensitization of the capillaries to the action of histamine. Since histamine is known to produce dilatation of the arterioles, venules and capillaries in man, studies were carried out to determine its use in peripheral vascular therapy. It was also known that histidine is converted to histamine in vitro by the action of ascorbic acid.

Patients were first given 500 mg. of sodium ascorbate intravenously. This was followed by the intramuscular injection of 5 cc. of a 4 per cent aqueous solution of 1(-) histidine monohydrochloride simultaneously with the subcutaneous injection of 100 mg. of sodium ascorbate. Caution was taken not to give the latter two in the same location. The subsequent regimen consisted in giving the two organic compounds in the manner described every four, six, eight or twelve hours, depending on the severity of the clinical findings. In addition, patients received 600 mg. of ascorbic acid orally daily.

Relief of intractable pain was dramatic in the persons afflicted, the relief occurring within six hours to three days after institution of the treatment. Patients with gangrene, regardless of the cause, have responded most quickly. Relief was also noted in patients with thromboangiitis obliterans without gangrene.

Parenteral administration of 1(-) histidine monohydrochloride-sodium ascorbate will be studied further to determine its value in the treatment of peripheral vascular disease and related diseases. Investigations are being carried out to determine the value of such therapy in coronary artery disease, angina pectoris, hypertension, glomerular nephritis, mesenteric thrombosis, cerebral vascular accidents, Parkinson's disease, multiple sclerosis, thrombosis of the central retinal vein, Meniere's disease, migraine and eclampsia.

A NEW ANALGESIC - AN-148

A preliminary report of a new analgesic agent, 1-dimethylamino-3, 3-diphenyl-2-methyl-4-hexanone, or AN-148, appears in Proceedings of the Staff Meetings of the Mayo Clinic (June 25, 1947). This new drug was classified as satisfactory for relief of pain after administering it to 106 patients to determine its value as an analgesic agent.

Administration of AN-148 orally, subcutaneously, intramuscularly and intravenously was without local reaction. The average intravenous dose has been 5 mg., though less has been used with success, and this is estimated to accomplish about the same as 15 mg. of morphine sulfate given by the same route. It is felt that it is safe to administer AN-148 to ambulatory patients. Only a few minor side reactions occurred and no evicence of respiratory depression appeared. One patient complained of cardiac palpitations at the

height of action of the drug. Neither nausea nor vomiting was encountered. To the present time, in the two cases in which patients received exceptionally large quantities of the drug, no tendency to addiction has been observed.

Patients given AN-148 for the relief of pain included a patient who had occlusive vascular disease of the foot, accompanying gangrene and severe pain; four patients who had chronic ulcerative colitis and severe generalized abdominal cramps; nine patients with pain occurring as spinal anesthesia was wearing off near the end of surgical procedures; and three patients with severe headache.

It is expected that AN-148 will prove to be a valuable analgesic agent, especially as a substitute for morphine, and further plans for continued investigation have been made. The drug for this study was supplied by Abbott Laboratories.

URETHANE IN LEUKEMIA

Urethane (ethylcarbamate) in the treatment of human leukemic patients is compared with x-ray therapy in The Lancet (May 11, 1946).

Nineteen cases of myeloid leukemia of which 18 were chronic were treated with urethane. In 13 patients who had no subsequent x-ray therapy, all showed undoubted response to urethane in that a dramatic fall in the white cell count took place. In 6 of the nineteen cases, x-ray therapy was given after a trial of urethane but in most cases x-ray therapy was equally unsuccessful.

After treating 13 cases of lymphatic leukemia with urethane it is concluded that the response to urethane is not as good and more variable in the treatment of lymphatic leukemia than in the treatment of myeloid leukemia.

Because urethane caused nausea and vomiting when administered by mouth in the dosage required, a solution in a special syrup of orange and chloroform water was found fairly satisfactory for oral administration. The dosage required to produce a significant fall in the white cell count varied within wide limits.

In conclusion the authors state that there is no indication that permanent benefit may result from the use of urethane in either myeloid or lymphatic leukemia; for relapses take place and immature cells may reappear in the blood. The cases are too recent to enable any statement to be made about effect of treatment on length of life. It can, however, be said that the palliative effect is in many cases very great.

A more recent study on the "Effect of Urethane on Mouse Myelogenous Leukemia" is reported in Science (March 7, 1947). The response of mouse leukemia to urethane was comparable to that seen in human leukemia, and urethane was shown to retard the growth of certain neoplasms of the mouse and human, although the alteration was not permanent.

SALICYLAMIDE AND DERIVATIVES AS ANALGESIC AGENTS

Salicylamide and its derivatives appear to equal or exceed the analgetic potencies of the established analgetic-antipyretic drugs is concluded by Hart in an experimental study reported in The Journal of Pharmacology and Experimental Therapeutics (March 1947). Since salicylamide and its derivatives had not been studied to determine their value as analgesic agents, an investigation of the two acetyl derivatives of salicylamide and two of its many possible halogen derivatives was made. These were compared with sodium salicylate, acetylsalicylic acid, antipyrine, aminopyrine, acetanilid and acetophenetidin in respect to toxicity and analgetic potency.

Oral administration of the drugs was used exclusively since the compounds used in this study are poorly soluble in water. Aqueous suspensions of the drugs (usually in 5 or 10 per cent concentration) with a 1.0 or 1.5 per cent concentration of gum tragacanth were administered from a hypodermic syringe through a stomach tube to rats, mice and rabbits. Evaluating the analgetic action of these drugs, more than 50 per cent of the animals given salicylamide and its diiodo derivative showed significant analgesia at a dosage approximately half the corresponding figures for the most potent of the established analgetics. The other amides do not seem to be significantly different from the established compounds.

All of the compounds studied appear to be similar in their toxicity for rats. The chronic toxicity of acetylsalicylic acid and of salicylamide was studied and it was found that salicylamide is considerably less toxic than acetylsalicylic acid when repeated doses are given at daily intervals.

The intoxication syndrome following administration of salicylamide or its derivatives seemed to differ in one important respect from that following the other drugs. All of the established analgetics produced convulsions prior to death while the amides seemed to have a depressant (or possibly paralytic) action.

Since salicylamide and its derivatives seem to have analgesic properties, it is concluded that this type of compound should not be neglected in any search for useful analgetics.

THE VETERANS ADMINISTRATION PHARMACIST

EDITED BY EDDIE WOLFE, CHIEF PHARMACIST, MT. ALTO VETERANS HOSPITAL WASHINGTON, D.C.

MEET A BRANCH PHARMACIST

DR. CHARLES SCHWARTZ

Branch Office 12 of the Veterans' Administration is located in San Francisco, California, and is responsible for the administration of veterans' affairs in California, Arizona, Nevada and the Territory of Hawaii. The area has a growing veteran population now numbering about 1,538,000.

To administer the huge veteran program in the area, Branch Office 12 has under its jurisdiction six regional and six subregional offices, forty-eight contact offices, twelve hospitals, two domiciliary homes and a National Service Life Insurance Office now in the process of being activated. Construction plans call for new hospitals at Fresno, San Diego and Phoenix. Additions are to be made to hospitals at Reno, Livermore and San Fernando. Plans are also under way for two one-thousand-bed neuropsychiatric hospitals at San Francisco and Los Angeles.

The activities involving the Medical Service are of especial interest to pharmacists. Foremost of these activities is the hospitalization program.

The regular VA hospitals have a bed capacity of 9,732. In addition there are 3,524 beds in domiciliary homes and 3,040 beds under contract in private and service hospitals making a grand total of 16,296.

Data concerning the VA hospitals are as follows:

Location	Type	No. of Pharmacists on duty
San Francisco, Calif.	General Medical	3
Oakland, California	General Medical	2
San Fernando, Calif.	Tuberculosis	1
Van Nuys, Calif.	General Medical	4
Palo Alto, Calif.	Neuropsychiatric	2
Livermore, Calif.	Tuberculosis	1
Los Angeles, Calif.	General Medical	Total of 7 for both
Los Angeles, Calif.	Neuropsychiatric	Los Angeles hospitals
Whipple, Arizona	Tuberculosis	1
Phoenix, Arizona	General Medical	1
Tucson, Arizona	Tuberculosis	1
Reno, Nevada	General Medical	1

All the above hospitals offer out-patient service. The six regional offices and one sub-regional office also offer out-patient service. Names and locations and number of pharmacists on duty at these stations are as listed as follows:

Office	Location	No. of Pharmacists on duty
VA Regional	San Francisco, Calif.	1
" "	San Diego, Calif.	1
" "	Reno, Nevada	1 (Services
" "	Phoenix, Arizona	1 shared
" "	Los Angeles, Calif.	3 with hos-
" "	Honolulu, Hawaii	None pital)
" Sub-regional	Oakland, Calif.	1

During 1946, 238 doctors were appointed to act in a part-time or consultant capacity in order to widen the scope of medical skill available in the hospitals. Also, residency training programs were instituted with 260 doctors being placed in three VA hospitals. The latter programs are under way in San Francisco and Los Angeles. They are being carried out in conjunction with the medical schools of Stanford, the University

of California, the University of California at Los Angeles, University of Southern California and the College of Medical Evangelists, Los Angeles.

Of particular interest to the retail pharmacists are the VA Agreements with State Pharmaceutical Associations whereby local member drug stores have been invited to participate in filling prescriptions written by authorized physicians or dentists for eligible veterans. Details of the agreements include:

a. Furnishing of medicines and certain medical requisites to eligible veterans;
b. Adherence to a prescription-pricing schedule;
c. Establishing the State Pharmaceutical Associations as the agencies of review of prescriptions and agencies through whom the VA makes payments to the drug stores.

At the present time pharmacy agreements have been concluded in California and Arizona. It is expected that agreements with Hawaii and Nevada will follow shortly.

In conclusion it may be stated that the mission of the Pharmacy Section of Branch Office 12 is to administer and coordinate the overall phases of the VA pharmacy program for the area. It is the aim of VA pharmacists to furnish veterans with the best pharmacy service attainable.

Note: All figures are as of December, 1946.

Dr. Schwartz, a native of Seattle, Washington, obtained his Ph.D. degree with a major in Pharmacy in 1935 at the University of Washington. While working for his degree, Dr. Schwartz was a Teaching Fellow in the College of Pharmacy.

Since 1935 he has been in the Government Service, until recently, with the National Bureau of Standards, U. S. Department of Commerce.

During the war he was with the Chemical Warfare Service, U.S. Army, for over four years. In April, 1946 he was separated from the service at Ft. Lewis, Washington, and is now a Major in the Reserve Corps.

His present position with the Veterans' Administration is that of Acting Chief Pharmacist of the Pharmacy Section, Medical Service, Branch Office 12, San Francisco, California.

SUGGESTIONS BY V. A. PHARMACISTS

Here is a formula that is much lower in cost than any commercial preparation of this type, suggested by D. Puchkoff, Ft. Custer Hospital. This preparation is easy to prepare, not sticky or gummy, is highly effective and very stable.

25% BENZYL BENZOATE EMULSION

Benzyl Benzoate (98-100%)	25 Gm.
Duponal (Sodium Lauryl Sulfate)	2 Gm.
Bentonite Magma (1/2 strength)	
Distilled Water, of each sufficient to make	100 cc.

Dissolve duponal in water, then add benzyl benzoate and magma bentonite. Mix well.

E. BURNS GEIGER

Mr. Geiger, the author of the article, "Pharmacy in The Veterans Administration", that appeared in the last issue of THE BULLETIN, is now the Chief, Pharmacy Operations, Veterans Administration in Washington, D. C.

After his graduation from high school, Mr. Geiger studied Pharmacy at the George Washington University in Washington, D. C. He received his B.S. degree in Pharmacy in 1936.

After receiving his license to practice pharmacy in Maryland, Mr. Geiger and his brother operated a retail pharmacy in Hagerstown, Maryland, from 1936 to 1942.

In November 1942 he was commissioned an Ensign in the U.S. Naval Reserve and saw active duty on the U.S.S. Iowa, U.S.S. Texas and at the Submarine Base, New London, Connecticut. In December 1945 Mr. Geiger was discharged and placed on inactive duty as a Lieutenant.

After being discharged he accepted the position as Pharmacist at the Washington County Hospital, Hagerstown, Maryland. In May of 1946, Mr. Geiger was appointed Chief, Pharmacy Operations, Veterans' Administration.

First display to be presented at Mt. Alto Hospital, Washington, D. C., under the Veterans' Administration policy of permitting manufacturers' exhibits, is installed by the Bilhuber-Knoll Corp. A. W. Braden (left), Bilhuber-Knoll representative, discusses display with Eddie Wolfe, Chief Pharmacist, in the Mt. Alto Hospital Pharmacy.

PROFESSIONAL DRUG DISPLAY PRESENTED AT MT. ALTO HOSPITAL PHARMACY

One of the first Professional Drug Displays to be presented in the Veterans' Administration was installed at the Mt. Alto Veterans' Hospital in Washington, D. C.

After approval was obtained, the Bilhuber-Knoll Corporation was authorized to furnish materials, drugs and a company representative. The display was set up conforming to V. A. regulations that only Council accepted items be presented.

After the Bilhuber-Knoll Corporation had obtained approval from the Central Office of the Veterans' Administration, Branch Office and Mt. Alto Hospital, approximately two days before the display was to be presented it sent to each staff physician an invitation giving time, place and a list of items to be displayed. Another letter was sent to the Chief Nurse inviting the Nursing Staff to the Pharmacy to visit the display.

The display was placed at an end of the Pharmacy which allowed room for about twenty-five people to circulate, see the display and receive literature and samples from the representative. The display with drug representative attending was open from 12:30 to 4:30 p.m.

The turnout was surprisingly satisfactory. Approximately thirty physicians attended - nearly the entire hospital staff. Those physicians who were late in visiting the display were called by telephone by the pharmacist to remind them that the display was in effect. Various members of the Laboratory Staff also were present. About sixty-five nurses from the Hospital Staff also attended. This group was divided into two sections and Mr. Braden, the Bilhuber-Knoll representative, presented a lecture on the various products displayed. Literature was distributed to all nurses interested.

The cooperation extended the Pharmacy by the Medical and Nursing Staffs was indeed gratifying. The response substantiated the point that new drugs and new ideas on medications are of interest to everyone and people will take time to learn these points.

That the new set-up of presenting Professional Drug Displays by drug companies in the V. A. hospitals is indeed a good one has been proved by the results obtained at the Mt. Alto Veterans' Hospital.

SUGGESTIONS BY V.A. PHARMACISTS

A stock control index system has been instituted in all hospitals and regional offices in Branch Area No. 9. This index system was established in our pharmacies for all items that may be stored in drawers, cabinets, safes, locker rooms or storerooms. This facilitates the work of a rotating pharmacist who may replace the regular duty pharmacist while on leave. This system is also helpful to other hospital personnel in locating drug items during the hours when the pharmacy is not officially open.

E. J. Lalonde
Branch Office No. 9

Edited by SISTER MARY ETHELDREDA
CHIEF PHARMACIST, SAINT MARY'S HOSPITAL, BROOKLYN

This second series of reviews still on the theme of "Teaching Student Nurses" is intended to assemble and bring to the attention of the instructor the noteworthy textbooks available for the presentation of a course in "Pharmacology".

TEXTBOOK OF PHARMACOLOGY FOR NURSES. By Margene O. Faddis, R.N., M.A., and Joseph M. Hayman, Jr., B.A., M.D. 433 pages, 5 3/8 x 8", 1943. Published by J. B. Lippincott Co., Philadelphia, Pa. Price $3.00

This text follows the Unit Plan of the Curriculum Guide. The first unit "Orientation to the Study of Pharmacology and Therapeutics" contains a review of drugs and solutions and much useful information of a practical nature. A statement of the purpose of study of the content preceding each chapter stresses the importance for the nurse in acquiring and assimilating the knowledge essential in the handling of drugs. Following each chapter is a section on "Special Points for Nurses". These give many practical and economic hints on the solution of many a doubtful situation which a student may encounter. For review purposes, a self-scoring test is found at the end of each chapter. The tests are of the modern comprehensive type. Answers are included.

The manner of presentation of the fundamentals of pharmacology is simple yet complete. The classification of the text is well organized. Modern aspects of therapy are considered. Illustrations are helpful. The book has been brought into accord with the U.S.P. XII, N.F. VII, and N.N.R., 1942. This book would be popular with preliminary students.

ESSENTIALS OF PHARMACOLOGY AND MATERIA MEDICA FOR NURSES. By Albert J. Gilbert, M.D., and Selma Moody, R.N. 290 pages, 6 x 8 3/4", 1944. Published by C. V. Mosby Co., St. Louis, Mo. Price $2.50.

This text is simple and concise and gives the most important material in a very compact form which may be readily assimilated by the student in a limited period of time. The book contains information on many official newer drugs and also many popular nonofficial preparations. Some of the drugs discussed are: Zephiran Chloride, Nikethamide, Dilaudid, Pentothal Sodium, Butyn; Specifics, such as, the sulfonamides, penicillin, and tyrothricin. A chapter has been added on Toxicology and Prescription Reading. The book is a moderate enlargement of the text over the first edition and conforms to the U.S.P. XII and N.F. VII.

PHARMACOLOGY AND THERAPEUTICS. By Maude B. Muse, R.N., A.M. 633 pages with 83 illustrations, 5 1/4 x 7 3/4", 1944, Fourth Edition, Revised. Published by W. B. Saunders Co., Philadelphia, Pa. Price $3.00

The conservative text has been revised and brought up to date to very effectively emphasize the importance and use of newer drugs. The author uses the official titles for drugs, so that, the student may correlate them with the proprietary name. A very fine feature of this text is the number of graphic formulae for the chemical drugs. The text also contains colored plates of crude drugs; comprehensive physiological charts and other diagrammatic illustrations; and explanations of physiological and pharmacological functions. Study suggestions at the end of each chapter help the student in practising self-evaluation. A summary of pharmacotherapeutic principles following each chapter condenses the content to a very simple and emphatic form and aids the student in remembering essentials. The presentation of fundamental therapeutics is very sound. The text follows the U.S.P. XII, N.F. VII and N.N.R., 1943.

PHARMACOLOGY, MATERIA MEDICA AND THERAPEUTICS. By Charles Solomon, M.D., and Hazel Houston, M.A., R.N. 823 pages, 91 illustrations, 5 3/8 x 8", Fifth Edition, 1943. Published by J. B. Lippincott Co., Philadelphia, Pa. Price $3.25.

This text is more comprehensive than others and contains more specific and detailed information. It links pharmacology with clinical medicine and ward practice. It conforms to the U.S.P. XII and N.F. VII and the Unit plan of the Curriculum Plan. Each drug is treated under the following topics: properties, pharmacology, action, effects, poisoning, preparations and dosage, therapeutics and administration. A portion of the text is devoted to the history of therapeutics and drugs and solutions. A chapter is devoted to toxicology and non-medicinal therapeutics. A portion of each unit is devoted to topics for class discussion and projects for further study.

The organization of the text may be confusing to the average preliminary student. It would be difficult for study purposes. It should be recommended as a secondary or reference text very highly.

The following texts have been reviewed by Sister Mary Ludmilla, Pharmacist, Firmin Desloge Hospital, St. Louis, Mo. in the paper titled "Textbooks Available for the Course of Pharmacology for Nurses" and presented at the annual meeting of the American Society of Hospital Pharmacists, Cleveland, Ohio, September 7, 1944.

MATERIA MEDICA, PHARMACOLOGY AND THERAPEUTICS. By A. S. Blumgarten, M.D., F.A.C.P. 875 pages, 5 1/2 x 8", Seventh Edition, 1941. Published by Macmillan Co., New York, N. Y. Price $3.50.

In this book of 875 pages the objectives are "to teach clinical bedside materia medica from the nursing aspect by a simple pedagogic plan". A good feature of the book is the inclusion of tables at the end of many chapters summarizing the information of the drugs treated in the chapter on prescription reading and one on physical therapy. The topics are not included in the regular course as outlined in "A Curriculum Guide for Schools of Nursing". The seventh edition is revised in accordance with the U.S.P. XI, therefore, is somewhat obsolete.

AN INTRODUCTION TO MATERIA MEDICA AND PHARMACOLOGY. By Hugh Alister McGuigan, Ph.D., M.D., and Elsie E. Krug, B.S., R.N. 53 pages, 37 illustrations, 5 1/2 x 8 3/4", Fourth Edition, 1945. Published by C. V. Mosby Co., St. Louis, Mo. Price $3.50.

This book will probably appeal to a pharmaci., instructor since many pages are devoted to pharmacy and 23 of the color plates are beautiful pictures of medicinal plants. Text illustrations also have been used freely. Considerable space is allotted to mathematics for nurses; hence, the book can be used for a dual purpose, namely, for the unit dealing with the preparation of solutions and the course designated as "Pharmacology and Therapeutics". Some of the text questions, for instance, those given on pages 322 and 434 are unique, and are similar to those offered and supplied by the Committee on Measurement and Educational Guidance of the National League of Nursing Education. The Fourth Edition has been brought up to date with the U.S.P. XII and N.F. VII and also includes a number of nonofficial preparations which have come into prominent use. Material has been added relative to new chemotherapeutic agents, treatment of burns, vitamin preparations and the uses of blood and its constituents.

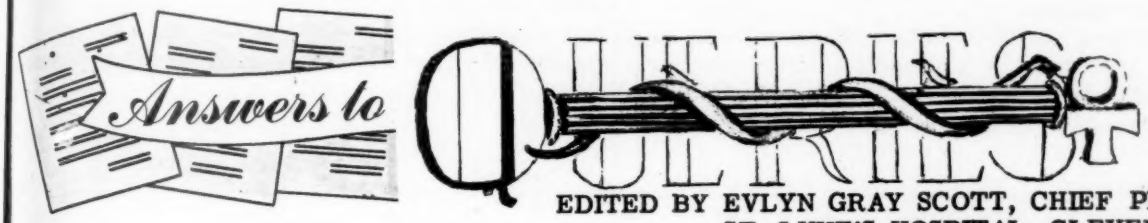
ELEMENTARY PHARMACOLOGY. By Walter B. Kreüger, Ph.D. 287 pages, 5 1/4 x 7 1/2", Fourth Edition, 1942. Published by W. B. Saunders Co., Philadelphia, Pa. Price $2.25.

This book is intended for beginning students only. Throughout the text the material is presented with a simplicity of style and a clearness and directness of expression seldom met in texts treating on the subject of elementary pharmacology. The section dealing with weights and measures, arithmetical processes and calculations, is especially commendable. It is not well suited however, for the advanced work in pharmacology. For advanced work it should be supplemented by other reference books or by notes from the instructor. Since the last revision was made in 1942, it is not entirely up-to-date. The titles of drugs and preparations do not all correspond with those of the U.S.P. XII and N.F. VII.

MATERIA MEDICA, PHARMACOLOGY AND THERAPEUTICS. By Harold Wright, M.S., Ph.D., and Mildred Montag, R.N., M.A. 712 pages, 5 1/4 x 7 3/4", Third Edition, 1944. Published by W. B. Saunders Co., Philadelphia, Pa. Price $3.00.

This book is the most nearly, up-to-date text-

book on pharmacology for nurses that has come under the observation of the writer. Five chapters, totaling 84 pages, are given to "Chemotherapeutic agents". In this section the sulfonamides, penicillin, tyrothricin, the new antimalarials, and chemotherapeutic agents used in the treatment of tropical diseases are given due consideration. Besides, under the narcotics, the actions and uses of Demerol are included. In another section, the intravenous administration of amino acids is discussed. However, like some of the other books, the section pertaining to the Harrison Narcotic Act is not entirely correct.



EDITED BY EVLYN GRAY SCOTT, CHIEF PHARMACIST, ST. LUKE'S HOSPITAL, CLEVELAND

METHERGINE

An Alabama pharmacist inquires where he could obtain information regarding the preparation METHERGINE; its possibilities for relieving gas pains following surgery, for use in obstetrics, and in certain X-Ray procedures.

The following is part of an introductory paragraph in an article in the Scientific Edition-Journal of The American Pharmaceutical Association for May, 1947, Vol. 36, No. 5, Page 145, entitled: "Further Studies on Two New Lysergic Acid Compounds: d-Lysergic Acid-dl-Hydroxybutylamide-2 (Methergine) and Dihydroergotamine (D.H.E. 45)."

"Recently, two newer ergot alkaloids have received considerable clinical trial in this country. Both drugs are partly synthesized from a lysergic acid radical with changes in the side chains but possess different pharmacologic actions. The compound called Methergine (1) is d-lysergic acid dl-hydroxybutylamide which is similar in chemical structure to Ergonovine but has one more methylene group. It has a potent oxytocic action and, already, its clinical use in obstetrics has resulted in several favorable reports."

The article gives 12 references. Methergine is a product of Sandoz Chemical works, New York City.

RADIOACTIVE COMPOUNDS

C.C. of Winnepeg, Canada asks for information on Radioactive Iodine, and if it is available. Due to the general interest in Radioactive Isotopes, we are reprinting in whole the following, which was taken from the May, 1947 issue of Southern Hospitals, Vol. 15, No. 5 - Page 108.

RADIOACTIVE ISOTOPES MADE AVAILABLE FOR LABORATORIES

"Mass availability of radioactive isotopes for biological and physical tracer studies and for experimental therapeutic use made possible by the chain reacting uranium pile is now beginning to make its influence felt in research laboratories and hospitals throughout the country. Monsanto Chemical Company, which operates Clinton Laboratories, Oak Ridge, Tennessee, for the Manhattan Engineer District, has reported that 160 orders have been filled since sales were begun four months ago. Demand for the isotopes is steadily rising.

While all of the isotopes sold thus far weigh only a small fraction of a pound, they represent very great amounts in comparison with the meager quantities previously available through cyclotron production. The sales to date have amounted to $21,600, or roughly their cost of production. In theory the same isotopes would have cost several million dollars if produced in cyclotrons. In practice they simply would not have been available.

The greatest demand has been for Carbon 14, produced in the pile for $367 per millicurie as against an estimated theoretical cost of several hundred thousand dollars per millicurie in a cyclotron. So far 45 lots of Carbon 14, totaling 37 millicurie, have been sold. Carbon 14 is essentially a research tool being used to tag molecules so that their course in chemical reactions may be charted. It is being employed in a wide range of scientific studies, among them photosynthesis, metabolism, rubber chem-

istry, cancer research and chemical reaction rates.

Second on the demand list is Iodine 131, of which approximately 1300 millicuries in 42 lots have been sold primarily for experimental use as a therapeutic agent in the treatment of hyperthyroidism. Pile production has reduced its cost to about one-tenth of the old cyclotron selling price, bringing the material to within the range of economic usefulness.

Nineteen orders of Phosphorus 32 have been filled. This isotope and radioactive gold are being evaluated as therapeutic agents in the treatment of leukemia, a blood disease. One institution has estimated the reduced price of radioactive gold enables it to treat five times as many leukemia sufferers as formerly.

Scientists are constantly seeking to discourage the false impression that radioactive isotopes can cure cancer. It is true that they are being used to seek an understanding of the causes of cancer.

Under the isotope sale program, applications for the materials are submitted to an allocation committee of scientists where they are screened with utmost care."

POSITIONS in hospital pharmacy

MICHIGAN . . . A woman pharmacist is wanted to fill the position of Assistant Chief Pharmacist at the W. A. Foote Memorial Hospital, Jackson. Working conditions excellent. Salary is open for discussion. Every other full Saturday and Sunday off. Weekend to work is 4 hours on Saturday and on call Saturday afternoons and Sunday. Call duty rotated. Two weeks' vacation and two weeks' sick leave per year. Pharmacy averages 100 prescriptions daily. Those interested may communicate with Mr. Alan Leamy, Administrator, or Dorothy E. Tobin, Chief Pharmacist.

OHIO . . . A pharmacist with hospital experience in manufacturing is wanted at Cleveland City Hospital, 3395 Scranton Road, Cleveland 9. If the individual has the proper qualifications he will be trained for the position, if necessary. For additional information write to P. J. Hanley, chief pharmacist.

MICHIGAN . . . A hospital pharmacist is wanted by the Chrysler Corporation to take charge of the pharmacy in its medical department. The pharmacist will manufacture certain preparations, supply various units of the Corporation with medicinals, have charge of selected items in the storeroom and do prescription compounding. The work week is 5 days, total of 40 hours a week. Salary to be discussed. For additional information write to Dr. John J. Prendergast, medical director, Chrysler Corporation, Detroit.

CURRENT LITERATURE

HOSPITAL MANAGEMENT

June 1947 - "A Procedure for Forming Policy In The Hospital Pharmacy" - A brief report of papers presented at the Tri-State Hospital Assembly's Conference of Hospital Pharmacists held in Chicago in May. page 84

"Registered Pharmacists Are Required in Florida Hospitals" - Florida Pharmaceutical Association agrees to promote a better understanding of the Florida law, which requires competent registered pharmacists to dispense and compound prescriptions in the drug stores and hospitals of the state. page 86

July 1947 - "How Your Pharmacy Department Can Save Time" - Suggestions by the A. S. H. P. including statements presented at the recent Institute on Hospital Pharmacy on raising the standards of pharmaceutical practice in hospitals. page 76

"Sees Radioactive Drugs for Diagnosis and Therapy" by Dr. Samuel K. Allison, Director, Institute for Nuclear Studies, University of Chicago - Applications of radioactive elements in the medical field are discussed. page 78

MODERN HOSPITAL

June 1947 - "Antimalarial Drugs and The War" - A review of drugs used as antimalarials to replace quinine including atabrine, santoquin, chloroquine, pentaquine, and plasmoquin. page 94

July 1947 - "Narcotic Control - Fact or Fancy?" by Sarah Hooker Hardwicke, M D., Assistant Director, Strong Memorial Hospital, Rochester, N. Y. - Suggestions for better control of narcotics in the hospital. page 60

SOUTHERN HOSPITALS

June 1947 - "With The Hospital Pharmacist" - Includes report of the Southeastern Hospital Pharmacists Association held in Bioloxi in April and a report of the meeting of the Florida Pharmaceutical Association held in Tampa in May, page 70

"The New Role of the Pharmacist" by Charles H. Dillon, Hospital Sales Manager, Wm. S. Merrell Co., Cincinnati, Ohio - A comparison of pharmacy of today with that of 35 years ago revealing the striking changes which have been made in pharmaceutical practice. page 71

July 1947 - "With the Hospital Pharmacist" - Includes a summary of the Institute on Hospital Pharmacy, results of the A. S. H. P. election and items on new drugs. page 70

"Revenue In the Pharmacy" by C. R. Simpson, C. Ph. Seaside Memorial Hospital, Long Beach, Calif. - How the progressive pharmacist can save the hospital money by keeping up with new drugs, by maintaining a yearly inventory and by cooperating with the administrative and medical staffs. page 71

JOURNAL OF THE A. PH. A., Practical Edition

"Hospital Practice - What Should It Mean to Colleges and Boards?" by L. F. Tice, Assistant Dean and Director of the pharmacy Department, P.C.P.S., Philadelphia. - The growth of hospital pharmacy including suggestions for training in hospital pharmacy and the recognition which hospital pharmacy deserves from the State Boards. page 279

AMERICAN PROFESSIONAL PHARMACIST

June 1947 - "Sterile Solution Manufacture" by Norman H. Shull, M. Sc. - A discussion of the standards which must be considered in the manufacture of sterile solutions in the hospital pharmacy. page 570

NOTES AND

EDITED BY

URETHANE PREPARATIONS FOR ORAL USE

In treating advanced cases of malignant diseases in man a fall in leucocyte count was noticed. This suggested the trial of urethane in patients with leukemia. The following formulas have been used at the University of Michigan Hospital to mask the taste of the urethane.

URETHANE SYRUP U.M.F. 0.5 GM./4 CC.

Urethane U.S.P. XIII	125.0 Gms.
Distilled Water	125.0 cc.
Acacia Syrup N.F. VIII, to make	1000.0 cc.

Heat the distilled water to dissolve the urethane therein. Make up to volume with the Acacia Syrup. Strain if necessary. Urethane may be obtained from Merck and Company, Inc., Rahway, New Jersey, or B. L. Lemke and Company, Inc., New York, New York.

A somewhat similar formula was published in Lancet, (May 11, 1946) page 677.

Urethane	1.0 Gm.
Syrup of Orange (Special)*	1.5 cc.
Chloroform Water, to make	15.0 cc.

SYRUP OF ORANGE (SPECIAL) *

Essence of Orange #1 (W. J. Bush)	12.0 cc.
Simple Syrup, to make	120.0 cc.

ZINC UNDECYLENATE PREPARATIONS

The zinc salt of undecylenic acid is being used for the treatment of tinea and various allied infestations of the skin. Two commonly requested preparations of this salt are the ointment and the powder.

ZINC UNDECYLENATE OINTMENT

Zinc Oxide	188.5 Gms.
Undecylenic Acid	1103.2 Gms.
Washable Base, to make	5000.0 Gms.

Allow the undecylenic acid and the zinc oxide to react in a two liter beaker for several hours. Warm slightly to start reaction if necessary then discontinue heat as reaction proceeds exothermically from that point. Stir until lumpy powder is formed. Then thoroughly mix the zinc undecylenate powder with the washable base and run through an ointment mill.

Formula is calculated to give a yield of zinc undecylenate 20% with a 5% excess of undecylenic acid.

The washable base formula used at the University of Michigan Hospital is as follows:

WASHABLE BASE U.M.F.

Cetyl Alcohol	600.0 Gms.
Stearyl Alcohol	600.0 Gms.
Duponol ME (dry)	150.0 Gms.
White Petrolatum	3000.0 Gms.
Propylene Glycol	1000.0 Gms.
Distilled Water	4650.0 cc.
to make	10000.0 Gms

Hydrophilic Ointment U.S.P. XIII may be substituted for the Washable Base U.M.F. given above.

ZINC UNDECYLENATE POWDER

Zinc Oxide Powder U.S.P.	37.7 Gms.
Undecylenic Acid	190.6 Gms.
Talc U.S.P.	760.0 Gms.

Mix the zinc oxide and undecylenic acid in a beaker of suitable size and allow reaction to go to completion. If necessary warm slightly to start

SUGGESTIONS

GEORGE L. PHILLIPS

ASSISTANT CHIEF PHARMACIST
UNIVERSITY HOSPITAL, ANN ARBOR, MICHIGAN

reaction then discontinue heat. When cool mix in a portion of the talc and sift through a number 30 sieve. Then add rest of talc and resift through a number 30 sieve. Package in 2 ounce shaker cans. Contains zinc undecylenate 20% with a calculated excess of 2% undecylenic acid.

Undecylenic acid is available from: Paragon Testing Laboratories, Orange, New Jersey and Eastman Kodak Company, Rochester, New York.

ALBRIGHTS IRRIGATING SOLUTION

A commonly requested solution for bladder irrigation is Suby-Albrights Solution sometimes requested as just Albright's. This solution in unsterile form supports bacterial growth rather well without a bacterial inhibitor. The formula given below represents a rather stable sterile solution, with a bacterial inhibitor, zephiran, added.

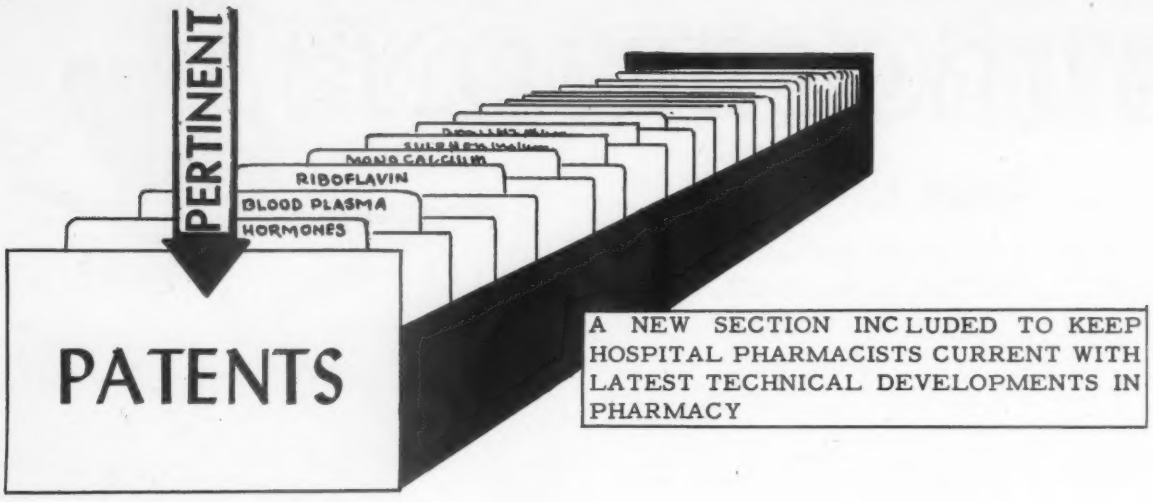
Citric Acid U.S P.	32.4	Gms.
Magnesium Oxide (heavy)	3.8	Gms.
Sodium Carbonate Monohydrated U.S.P.	5.0	Gms.
Zephiran Solution Concentrate 12.8%	0.75	cc.
Distilled Water, to make	1000.0	cc.

Dissolve the citric acid in 800 cc of distilled water then add the sodium carbonate and magnesium oxide and stir until reaction is complete. Add the zephiran chloride and make up to volume with distilled water. Filter through hard paper or a bacteriological filter and autoclave at 15 pounds for 20 minutes.

EXACT WEIGHT PACKAGING

The subdivision of hospital bulk packages into smaller prescription size packages has long been

a problem for the hospital pharmacist. The use of an Exact Weight Scale as illustrated in the accompanying photograph helps to make your tablet or capsule count more accurate and speeds up the procedure. Simply hand count the first package and place in the left scoop. For further packages add tablets, capsules, or powders in the right scoop until the indicator shows exact weight. The operation is strictly mechanical, fast, inexpensive and accurate to less than 1%. Claims of packaging cost savings of 85% are made. Further savings of more packages from bulk would no doubt follow. Further information may be obtained from: The Exact Weight Scale Company, 944 West Fifth Avenue, Columbus, Ohio.



STABLE RIBOFLAVIN-NICOTINAMIDE SOLUTIONS

Douglas V. Frost (to Abbott Laboratories Inc.). U. S. patent 2,407,412. Riboflavin-nicotinamide solutions may be physiologically stabilized by adjusting the pH values of the solutions to 2.6-6.6 and preferably from 4.4-6.6. Dissolve riboflavin 0.10 and nicotinamide 5.00, (per cent w/v solution) in hot water, warm, cool, and adjust the pH to 4.5-6.6 with hydrochloric acid. Mix riboflavin 0.1, nicotinamide 5.00, and thiamin hydrochloride 0.50% with about 80% of the total volume of water required in the formula, warm, and cool after solution. Add sodium dihydrogen phosphate to adjust pH to 4.5-5.0. Mix riboflavin 0.3, nicotinamide 10.0, thiamin hydrochloride 1.0, pyridoxine hydrochloride 0.1, with water about 80 cc., and warm. After solution add calcium pantothenate 1.0, and boric acid 0.5 gm., and make to 100 cc. This mixture has a pH about 4-5 and the solubility of riboflavin has apparently been increased 50%. Nicotinamide has marked effect in making riboflavin more soluble. The solubility of riboflavin in nicotinamide solutions is 0.1 in 5, 0.28 in 10, 0.6 in 20, 1 in 30, 1.6 in 40, and 2.5% in 50% at pH 5. Boric acid also increases the solubility of riboflavin. The pH also has an effect on the solubility of riboflavin for as pH is lowered the solubility of riboflavin decreases. While 5% nicotinamide dissolves 0.1% riboflavin at pH 4.3 and above, at pH 4.05, 3.6, 3.2, 3.0 and 2.5, 5% nicotinamide dissolves 0.095, 0.07, 0.056, 0.044, and 0.032% respectively, of riboflavin. The decrease is apparently related to salt formation between electropositive nicotinamide and acid anions; thus 10% nicotinamide hydrochloride has a pH of 2.0 and low solubility for riboflavin. Chemical Abstracts, 41:254, January 10, (1947).

SARCOSINE ANHYDRIDE AS SOLUBILIZER

Walter Karrer (to Hoffman-La Roche, Inc.). U. S. patent 2,410,949. Well tolerated and nontoxic sarcosine anhydride increases the solubility of certain flavone glucosides and aglucons. Quercitrin 15 parts is shaken for 3 hours with 1000 parts of a 30% aqueous solution of sarcosine anhydride. The product is filtered, and the clear, yellow, 1.4-1.5% solution of quercitrin can be filled into ampuls and sterilized. Neohesperidin forms 2% solution in a 20% solution of sarcosine anhydride. Hesperitin forms a 0.6-0.7% solution in a 30% solution of sarcosine anhydride. Chemical Abstracts, 41:837, February 10, (1947).

VITAMIN B-COMPLEX TABLETS

Walter A. Compton and Richard S. Nicholls (to Miles Laboratories, Inc.). U. S. patent 2,406,741. B-complex vitamins can be incorporated into milk-protein-containing materials, such as dried whole milk powder, dried skim milk powder, or dried buttermilk powder, to give stable tablets. An analysis of a typical dried buttermilk powder from sweet cream suitable for such tablets is, in per cent: protein 31.92, ash 7.72, calcium oxide 1.42, phosphorus pentoxide 2.24, water 4, fat 6.5, lactose 48.12, acid as lactic acid 1.67, riboflavin 30 γ/gram, pantothenic acid 30 γ/gram, and nicotinic acid 8-10 γ/gram. The components of a batch, in grams, are thiamin 6, riboflavin 10, nicotinamid 50, vitamine B_6 1.25, calcium pantothenate 5, cocoa powder 550, cane sugar 550, dried buttermilk 830, and saccharin 1.65, Flavor the cocoa with small amounts of coumarin in alcohol solution and allow the alcohol to evaporate. Triturate the vitamins with the dried buttermilk and mix

with sugar and cocoa. Compress the dry mixture into slugs, break up into granules by forcing through a screen, and tablet in the usual way into 0.4 gram tablets. This tablet is palatable, stable, and contains the minimum daily requirements of vitamins noted. Vanillin is not compatible with thiamin because it is a reducing agent. Chemical Abstracts, 41:254, January 10, (1947).

NEW SULFANILAMIDE DERIVATIVES

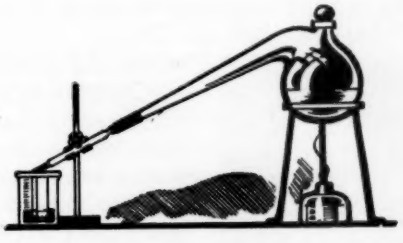
Simon L. Ruskin (to Frances R. Ruskin). U. S. patent 2,407,686. New sulfanilamide derivatives are prepared containing purine nucleotides, creatine, creatinine, hydantoin derivatives, and similar substances produced in animal metabolism. These water-soluble compounds are claimed to be either less toxic or more selective in action than the parent sulfa drug. Bactericidal properties apparently are enhanced by the presence of phosphoric acid radicals in nucleic acids and nucleotides. Hydantoin derivatives possess an anticonvulsant as well as bactericidal action and are therefore indicated in chorea and similar conditions. Sulfacreatine and sulfacreatinine do not precipitate in the kidneys like other sulfa drugs, thus avoiding damage to the kidneys. The general method of preparation of these compounds, unless indicated otherwise, consists in condensation of acetylsulfanilyl chloride with the compound in pyridine at 10-15°, precipitation of the condensation product with water, and removal of the acetyl group with sodium hydroxide or sodium hydroxide or sodium methylate in methyl alcohol. In this way the water-soluble sodium salts are obtained. Several new compounds are described. Chemical Abstracts, 41:1393, March 10, (1947).

STABLE PENICILLIN SALTS

Schering Corporation. British patent 578,590. Stable and active forms of penicillin may be prepared by converting penicillin to its salt with an inorganic base, such as ammonia, under substantially anhydrous conditions. For example, the culture medium, after elimination of the mold by filtration, was acidified and extracted with an organic solvent such as chloroform and this solution in the organic solvent was dried and dry ammonia gas passed through the solution. The dry ammonia salt precipitated and was separated by centrifuging. In a similar manner other inorganic salts, such as the magnesium oxide and sodium bicarbonate salts, may be prepared. The inorganic salt may be decompounded with acid and the process repeated to accomplish a higher degree of purification. The ammonia salt is nonhygroscopic and can be stored at ordinary temperatures for considerable periods of time without appreciable loss of potency. Chemical Abstracts, 41:1394, March 10, (1947).

ANTIPERSPIRANT PREPARATION

Earl L. Richardson and Kenneth L. Russell (to Colgate-Palmolive-Peet Co.). U. S. patent 2,412,535. Improved cosmetic preparations for retarding or inhibiting perspiration in localized areas of the skin, yet relatively noncorrosive to fabrics, have been formulated and tested. These preparations can be solutions, emulsions, creams, or salves containing common ingredients used in cosmetics and made by the usual methods. A suitable preparation contains the following ingredients: (1) acid stabilized glycerol monostearate 16 and spermaceti wax 5 parts and (2) aluminum sulfate 19, aluminum phosphate 7, and water 53 parts. By varying the components of (1), and the water in (2), the consistency can be modified as desired. The ingredients of (2), are the important agents in controlling the antiperspirant action and the degree of corrosiveness to fabrics. By varying the percentage composition of (2), or by the addition of calcium phosphate, sodium phosphate, magnesium phosphate, or aluminum chloride to (2), preparations can be made that vary in corrosiveness to fabrics as shown by tensile strength measurements. Chemical Abstracts 41:1400, March 10, (1947).



NEWS ITEMS

A.S.H P. TO EXHIBIT AT AMERICAN HOSPITAL CONVENTION

An educational exhibit sponsored by the American Society of Hospital Pharmacists will be in place at Kiel Auditorium, St. Louis, Missouri as the 49th annual convention of the American Hospital Association opens Monday, September 22. The exhibit is under the direction of a committee from the Hospital Pharmacists Association of Greater St. Louis. Chairman of the exhibit committee is Francis Rudi, chief pharmacist of Missouri Pacific Hospital. The committee is arranging a special program for hospital pharmacists, planned so that it will not interfere with the program of the convention.

This year's program of the American Hospital Association Convention is particularly interesting to hospital pharmacists with administrative duties and those interested in interdepartmental and interprofessional relationships. The program has been divided into four sections - Professional Practice, Administrative Practice, Hospital Planning and Plant Operation, and Special Aspects of Hospital Administration. Audience panels will assist with discussions after each session to assure general participation in all sections.

ARCHAMBAULT DIRECTS NEW PHARMACY SECTION U.S.P.H.S.

GEORGE ARCHAMBAULT

A newly created pharmacy section has been established in the Hospital Division of the United States Public Health Service for the further development of the pharmaceutical activities in the Marine Hospitals and their adjunct medical relief stations. This action brings an organized pharmacy service for the first time to the oldest of the hospital groups operated by the Federal Government.

The new pharmacy service in the Hospital Division will be under the direction of George F. Archambault, graduate and former faculty member of the Massachusetts College of Pharmacy. Mr. Archambault also holds the degree of bachelor of laws and is a member of the Massachusetts' bar. At Massachusetts College of Pharmacy he was lecturer in the business administration and pharmacy departments, from which post he was given a year's leave of absence to serve as director of professional relations in the New England States for the Liggett Drug Company.

During the war years, on loan from the Massachusetts College of Pharmacy, Mr. Archambault was chief pharmacist at the Boston Marine Hospital. He has published numerous articles on forensic pharmacy, business management, and professional relations in the hospital and retail pharmaceutical field.

The Hospital Division of the Public Health Service has the responsibility of providing medical, dental and hospital services for American merchant seamen, members of the Coast Guard and their dependents, the Coast and Geodetic Survey, foreign merchant seamen, and others designated by law. It provides this service primarily through its system of 24 Marine Hospitals and 115 medical relief stations which are located throughout the United States and its possessions. The Marine Hospitals date back to 1798, in the administration of John Adams, which marks the beginning of the United States Public Health Service.

As elsewhere throughout the far-flung activities of the Public Health Service, the Hospital Division is organized around a body of commissioned officers representing the several public health professions. This commissioned corps may in time of war be made part of the military forces by executive order of the President, as was the case in World War II.

Some time ago the Hospital Division recognized the need for development and coordination of its pharmaceutical activities, in view of the fact that hospital pharmacies or dispensaries are operated in all of the Marine Hospitals and in many of their out-patient departments. As a result of a survey instituted in 1945, with the help of the American Pharmaceutical Association, a program was developed for the purpose of raising the professional level of the pharmacy activities in the Marine Hospitals and dispensaries, as well as coordinating these activities with the

other professional services. The establishment of the new pharmacy service was a major result of this program.

A further important development in connection with this program is a plan for commissioning a limited number of pharmacy college graduates every year in the Public Health Service Commissioned Reserve Corps, selecting such men as have demonstrated special interests and abilities for careers in the public health field. Already an active recruiting campaign for pharmacists to be placed under commissioned status has been conducted by the Public Health Service - the first such recruitment for pharmacists since 1920. From the resulting list the first appointments are to be made of pharmacists to serve as commissioned officers in the regular corps of the Public Health Service; and similar examinations will presumably be held in the future as the needs of the Service indicate.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE PHARMACY SUBSECTION MEETING

The next meeting of the American Association for the Advancement of Science will be held in Chicago, Illinois on December 26-31, 1947. The program of the Pharmacy Subsection of the Medical Sciences is being made up. Three sessions of our Subsection will be held on Saturday, December 27, as follows: Sherman Hotel, Rose Room 9 A.M. and 1:30 P.M. and Grey Room 7:30 P.M. Subjects: Radioactive tracer elements in pharmaceutical research, pharmaceutical engineering, general subjects.

, Authors who wish to present papers before the Subsection are requested to send in titles of papers as soon as possible. All titles for inclusion in the printed program must be in by October 10. Titles for papers should be sent to Glenn L. Jenkins, Chairman of Subsection NP., Purdue University, School of Pharmacy, Lafayette, Indiana.

DUGAN ELECTED TO U.S.P. REVISION COMMITTEE

JOHN J. DUGAN

John J. Dugan, secretary and professional director of the Taft Pharmacy, New Haven, Connecticut, has been elected as a member of the Revision Committee of the United States Pharmacopoeia. Mr. Dugan, an outstanding pharmacist of the East and associate member of The American Society of Hospital Pharmacists, will serve on the sub-committee on ointments, cerated and miscellaneous galenicals.

NEW MONTHLY BULLETIN PUBLISHED BY LOUISIANA HOSPITAL PHARMACY GROUP

Hospital Pharmacy took another professional stride last month when the Louisiana Society of Hospital Pharmacists published July 1st its first monthly bulletin for the purpose of disseminating information to the hospital pharmacist about new drugs and their uses. A. P. Lauve, prominent Southeastern hospital pharmacist and chief at the Mercy Hospital, New Orleans, believes "the bulletin will do much to maintain interest in the association especially (among) those members who reside outside the city (New Orleans) and cannot attend meetings regularly."

The Committee on Current Affairs, which follows, is responsible for the monthly publication of the new bulletin: Troy Carter, Albert Lauve, Herbert Mang, Foundation Hospital; Mrs. Nina Philibert, Baptist Hospital; Guy Leefe, U. S. Marine Hospital; and Valerie Armbruster, Charity Hospital.

The Louisiana Group is a pioneer in hospital pharmacy organizations in the Southeast at the state level, and actively supports the Southeastern Hospital Pharmacy Association, which is affiliated with the American Society of Hospital Pharmacists.

APPOINTMENTS

MISS HAZEL MENZIES, a 1947 graduate of the University of Buffalo School of Pharmacy has been appointed to the Pharmacy Staff of the Buffalo General Hospital.

JESSICA C. WALKOWSKI (formerly Dumanski), a 1945 graduate of the University of Buffalo has been appointed first assistant to Chief Pharmacist Francis X. Sturner at the Buffalo General Hospital.

MR. GROVER C. BOWLES, formerly assistant to the chief pharmacist, University Hospital, Ann Arbor, Michigan has been appointed instructor in Pharmacy at the University of Tennessee, Memphis.

MR. NORMAN BAKER, formerly supervisor pharmacist at the University Hospital, Ann Arbor, Michigan has accepted an appointment as chief pharmacist at Norfolk General Hospital, Norfolk, Virginia.

MR. WILLIAM E. WOODS, formerly hospital pharmacist with the U. S. Public Health Service has been appointed to the staff of the Pharma-

ceutical Survey to make a special study of laws and regulations of the State Boards of Pharmacy.

MISS CAMILLA BERSONI, recent Wayne University graduate, is now assistant to Katie Moy Lim, chief pharmacist of Alexander Blain Hospital, Detroit.

MR. WILLIAM REYNOLDS, formerly supervisor pharmacist at University Hospital, Ann Arbor, Michigan has been appointed chief pharmacist at St. Joseph Hospital, Ann Arbor.

BERNARD E. CONLEY of Columbus, Ohio, formerly with the Veterans Administration Branch Office No. 6, has been appointed to the staff of the Council on Pharmacy and Chemistry of the American Medical Association. Mr. Conley, a graduate of Duquesne University School of Pharmacy, was for a time hospital pharmacist at Ohio State University Hospital and later was acting chief of the Pharmacy Division, V. A. Branch Office 6. His duties will be concerned primarily with checking data and gathering information on new drugs and special products, preparing reports and answering inquiries.

CHARLES W. BLIVEN, professor of Pharmaceutical chemistry, has been appointed dean of The George Washington University School of Pharmacy, Washington, D.C. Professor Bliven has been acting dean of the school for the past year.

DR. RUFUS A. LYMAN, former dean of the University of Nebraska School of Pharmacy has accepted the deanship of the newly established School of Pharmacy at the University of Arizona. Dr. Lyman, this year's recipient of the Remington Medal, is also editor of The American Journal of Pharmaceutical Education and for years has been an outstanding leader in American Pharmacy.

DR. L. DAVID HINER, formerly professor of pharmacy at Ohio State University, University of Florida, and South Dakota State College, is now dean of the newly established School of Pharmacy, University of Utah.

ORGANIZATION NEWS

Edited by HERBERT L. FLACK

CHIEF PHARMACIST, JEFFERSON MEDICAL COLLEGE HOSPITAL, PHILADELPHIA

THOUGHT FOR THE MONTH: With the approach of September, most groups of hospital pharmacists will begin making plans for their group meetings during the coming fall, winter, and spring months. This season presents a challenge to every organization of hospital pharmacists to attempt an increase in their membership, to publicize the growing importance of hospital pharmacy, and to meet the problems that face hospital pharmacy and hospital pharmacists in general.

In an effort to meet the many problems facing us this coming year, it is suggested that every local organization of hospital pharmacists appoint live and active members to head the following committees.

1. Program Committee: It was noted this past year that several groups were changing their programs from the social type to serious business-like meetings. At these meetings, three or four of the members would participate by presenting talks on specific subjects of interest and value to all. The other members would enter into the question and discussion period at the end of the program. Throughout the year, all members were required to talk on one or more subjects, during the preparation of which the speaker undoubtedly obtained much general information of value to himself. Typical subjects were: a. Digitalis and Similar Preparations, b. antispasmodics, c. Drug Standardization, d. Patient Charges For Drugs. Let's take hospital pharmacy apart, bit by bit, and analyze ourselves and our reasons for doing things with the hope that we might improve some of our technics, and at least learn how our associates are doing things.

2. Membership Committee: Each group should send notices of meetings to not only its members, but to every hospital pharmacist within at least a fifty mile radius. It is thought that many groups in large cities have short-sightedly left out those persons who live in the suburbs or those local hospital pharmacists who are not members.

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NEW MEMBERS

ALABAMA

Dora Gainnatelli
8 Kenneth St.
Mobile

CALIFORNIA

Burr R. Cole
8228 Geary
San Francisco

Mary N. Etchart
Route 2
Ontario

Charles Hagan
354 - 12th St.
Santa Monica

Ira Hamilton
1320 W. 5th St.
Los Angeles

Norma R. Irish
445½ S. Burlington
Los Angeles

Albert Rice
730 N. Garfield
Pasadena

Charles G. Towne
5155 Village Green
Los Angeles

CONNECTICUT

Jane Carroll
2209 Main St.
Bridgeport

John De Nicola, Assoc.
1440 Dixwell Ave.
Hamden

DELAWARE

Glenn N. Emanuel
V. A. Hospital
Wilmington

FLORIDA

Charlie B. Barnett
2375 Blainding Blvd.
Jacksonville

GEORGIA

Ronald A. Shumway
5998 Peachtree Rd.
Atlanta

ILLINOIS

Theresa M. Broccolo
1333 So. Austin Blvd.
Cicero

Sr. Cecile, O.S.F.
St. Francis Convent
Springfield

George R. Neupert
602 W. University
Urbana

Mary A. Maloney, Assoc.
16 Broadway Place
Normal

Harry C. Snyder, Assoc.
8131 Evans
Chicago

Sr. Mary R. Weichlein
1401 E. State
Rockford

LOUISIANA

Rufus L. Dupree
3323 Jackson
Alexandria

Joseph Gianelloni
2739 Aubry St.
New Orleans

MAINE

Sr. Mary L. Landry
144 State St.
Portland

MARYLAND

Philip H. Millman
1701 Ruxton Ave.
Baltimore

Frederick A. Schumm
3207 E. Lombard
Baltimore

Edwin Whittemore
3817 Belair Rd.
Baltimore

MASSACHUSETTS

Howard G. Loring
45 Grove St.
West Concord

John B. Whittaker
163 Boxford St.
Lawrence

MICHIGAN

Claude C. Jones
183 West St.
Battle Creek

MINNESOTA

Sr. Alice Bear
9th & Exchange
St. Paul

Azor J. Kleven
910 - 23 Ave. So.
Minneapolis

Charles Zwisler, Assoc.
4329 Coolidge Ave.
St. Louis Park

MISSOURI

William N. Cason
231 So. Old Orchard
Webster Grove

Edward T. Koyama
5095A Delmar Blvd.
St. Louis

Arthur L. Leakey
2517 E. 11th St.
Kansas City

Earle G. Walker
O'Reilly Hospital
Springfield

Paul E. Willey
3871 A Connecticut
St. Louis

Clyde C. Winter
617 Forster
Farmington

NEW JERSEY

Henry Bloch
90 Park Ave.
Passaic

Cosmo Genovese
307 Highland Ave.
Newark

Abraham Heimoff
20 Washington Pl.
Newark

George E. Morris
18 E. Passic St.
Maywood

Ludwig Pesa
226 Floyd St.
Belleville

Max Rubin
408 Darrow Ave.
Plainfield

Audrey Schilke
63 Spring Lane
Englewood

NEW YORK

Sr. M. Ann Bowne
St. Francis Hosp.
Poughkeepsie

Rose Fried
528 W. 111 St.
New York

Celia Harris
37 Dakota Ave.
Buffalo

Benjamin F. Miles
1337 Park Ave.
Rochester

Elizabeth Noonan
Highland Hospital
Rochester

George A. Orr
69 State Rd.
Binghamton

Harry Rashmajian
321 E. 42nd St.
New York

Betty M. Stehlik
The New York Hospital
New York

NORTH CAROLINA

Emma M. Kraus
1400 Scott Ave.
Charlotte

Ernest W. Rollins
N. C. Baptist Hospital
Winston Salem

OHIO

Robert H. Bower
2238 Homestead Dr.
Columbus

James Duckworth, Assoc.
249 Shields Rd.
Youngstown

Herbert Gilson
539½ Carroll
Youngstown

William O. Hays
Crile Hospital
Cleveland

William J. McGarrity
Gypsy Lane & Goleta Ave.
Youngstown

Christine M. Reinhardt
4345 Ashland
Norwood

Herbert Rudduck, Assoc.
204 Melrose
Youngstown

OKLAHOMA

Earl P. Porter
V. A. Hospital
Muskogee

Robert L. Tucker
223 S. Carter
Norman

Paul R. Voss
229 S. 6th St.
Muskogee

PENNSYLVANIA

Italo A. Bianculli
351 La Mont Place
Pittsburgh

John S. Eby
Pennhurst State School
Spring City

Gaetano Sambuco
125 Chatham Rd.
Upper Darby

Sr. Freda Wente
2100 S. College Ave.
Philadelphia

SOUTH CAROLINA

Perrin C. Byars
115 S. Queen
Columbia

TENNESSEE

William D. Upchurch
188 So. Bellevue
Memphis

TEXAS

Carl H. Donathan
1244 Shaw
Ft. Worth, Texas

Sr. Dolores Girault
1014 N. Stanton
El Paso

Arvon J. Jones
McKinney

Leo J. Snyder
515 Morales
San Antonio

WISCONSIN

Sr. M. Marcina Boff
430 E. Division
Fond du Lac

Sr. M. Emmelia Fischer
185 Hazel St.
Oshkosh

Doris R. Shimon
701 N. Church St.
Watertown

Leonard E. Tousman
512 E. Hampton
Milwaukee

CANADA

Samuel Bagen
647 Bloomfield Ave.
Montreal, Quebec

Ruth C. Davis, Assoc.
560 DeCourcelles St.
Montreal, Quebec

James A. McDonald
101 College St.
Toronto, Ontario

Sr. M. Marguerita
13th & 9th Ave.
Lethbridge, Alberta

Perrin C. Statia
28 Herlan Ave.
Kitchener, Ontario

ORGANIZATION NEWS

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3. Publicity Committee: This committee should function to advertise meetings of the hospital pharmacist group. Publicity in local newspapers, in the journal of the state pharmaceutical association, and in the various national pharmacy and hospital journals will be of value in selling hospital pharmacy. Needless to say, news of group meetings should be sent voluntarily and automatically to the editor of this section.

4. Committee on Legislation Affecting Hospital Pharmacy: This committee should appoint a member to serve on the legislative committee of the state pharmaceutical association. It should attempt to influence the political situation sufficiently to place at least one hospital pharmacist on the State Board of Pharmacy. It should appoint a member to the advisory committee of the State Board of Pharmacy if there is such an advisory committee. It should attempt to initiate legislative changes in those states that presently restrict the credit allowed for practical experience in a hospital pharmacy.

5. Convention Committee: This committee should function to arrange professional exhibits for every medical, pharmaceutical, or hospital convention or exhibition that is given in the area or in the state. If possible, it should also provide a program for a Section on Hospital Pharmacy at the conventions and meetings. This committee would work in cooperation with the American Society of Hospital Pharmacists.

6. Professional Relations Committee: This committee could be combined with one of the others; if desired. It should function to correlate the activities of the hospital pharmacist group with local and state pharmaceutical and medical groups and meetings. It should make a special endeavor to obtain close cooperation with the state pharmaceutical association.

7. Committee on Cooperative Purchasing: This committee could attempt to provide economies to all members' hospitals through group purchasing of certain items in larger quantities than any particular hospital pharmacy could purchase the item.

8. Committee on Swapping: This committee would correlate information from those members who have an excess stock of any particular supply. Often items that are no longer used in one hospital are widely used in other hospitals. Such swapping would prove of value to all in getting rid of stock that is no longer used.

9. Committee on Minimum Standards: This committee, with cooperation of the state and national hospital associations, would actively attempt to prove to those hospitals with no pharmacist, the value of competent pharmaceutical services (solicit information from those hospitals in the area, and attempt to prove the economies of, and the need for a hospital pharmacist). This committee should also attempt to evaluate each member's hospital pharmacy in an attempt to raise all standards to meet the new "Minimum Standards For A Hospital Pharmacy," soon to be presented by the American Society of Hospital Pharmacists.

10. Committee On New Drugs: This committee should attempt to correlate information on new drugs (either those accepted by the F.D.A., or those being used experimentally in members' hospitals). Such information would be presented in abstract form as a part of the regular meetings.

11. Of course there are other committees required such as the Committee on Constitution and By-Law Revision, Nominating Committee, and others which are not listed here.